

# ***TotalCeph User Manual***

TotalCeph is an application designed to assist orthodontists in patient image management, cephalometric analysis, treatment planning and simulation. This user manual contains basic information about the usage of the application. Below you find the main sections of this manual.

- [System Requirements](#)
- [Licensing](#)
- [Installation](#)
- [License Activation](#)
- [User Manual](#)
- [Support](#)

## ***System Requirements***

TotalCeph application can run on computers with Windows or Mac OS X operating systems.

### ***Windows System Requirements***

Windows version of TotalCeph application supports Windows XP with Service Pack 3 (Home Edition or higher), Windows Vista and Windows 7 operating systems. Minimum and recommended system requirements are listed as follows:

#### ***Minimum System Requirements***

- Windows® XP Service Pack 3 operating system
- 1 GHz Pentium IV processor
- 512 MB memory
- 1 GB available disk space
- Internet connection (for activation during setup)

#### ***Recommended System Requirements***

- Windows 7 operating system
- 2 GHz Core i5 processor
- 4 GB memory
- 50 GB available disk space
- Internet connection (for activation during setup)

### ***Mac OS X System Requirements***

Mac OS X version of TotalCeph application supports Mac OS X 10.6 and later 64-bit operating systems. Minimum and recommended system requirements are listed as follows:

#### ***Minimum System Requirements***

- Mac OS X 10.6 64-bit operating system
- 1 GHz Core Duo processor
- 512 MB memory
- 1 GB available disk space
- Internet connection (for activation during setup)

#### ***Recommended System Requirements***

- Mac OS X 10.7 64-bit operating system
- 2 GHz Core i5 processor
- 4 GB memory
- 10 GB available disk space
- Internet connection (for activation during setup)

## ***Licensing***

TotalCeph has two different licensing models, Trial Version and Full Version.

Trial version can be used for 30 days without a limitation and it's totally free. Trial version can be downloaded from [www.totalceph.com](http://www.totalceph.com) by signing up. Trial version stops working at the end of the trial period, so full version should be purchased.

Full version license can be purchased from [www.totalceph.com](http://www.totalceph.com). After purchased, full version application can be used without a time or any other limitation. But full version license is an annual license, and should be renewed **every year over the internet, free of charge**. If licenses that are not renewed annually, application stops working, so the computer that TotalCeph runs on, should have an internet connection at least once in a year.

There are special licensing alternatives for academic institutions. Please contact us at [www.totalceph.com](http://www.totalceph.com) or email at [sales@totalceph.com](mailto:sales@totalceph.com) for more information about academic licensing.

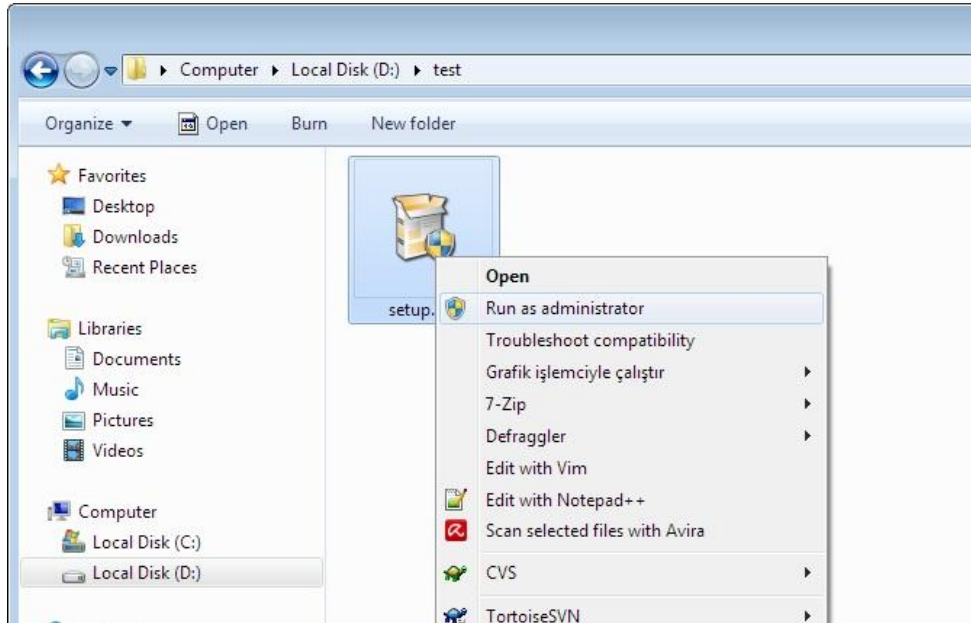
**Renewing Full Version License:** The application will warn user before annual license period ends (two weeks before license end date, on every application startup). License can be renewed easily and free of charge by pressing "Yes" on related warning message dialog inside the application. **Attention:** There should be an Internet connection on your computer during the license renewal process.

## Installation

### Windows Installation

For installation of TotalCeph on Windows Operating Systems please follow the steps listed below.

- Extract the zip file, which is downloaded from TotalCeph web site to any folder.
- From the folder you extracted the zip file, run setup.exe with administrator privileges.



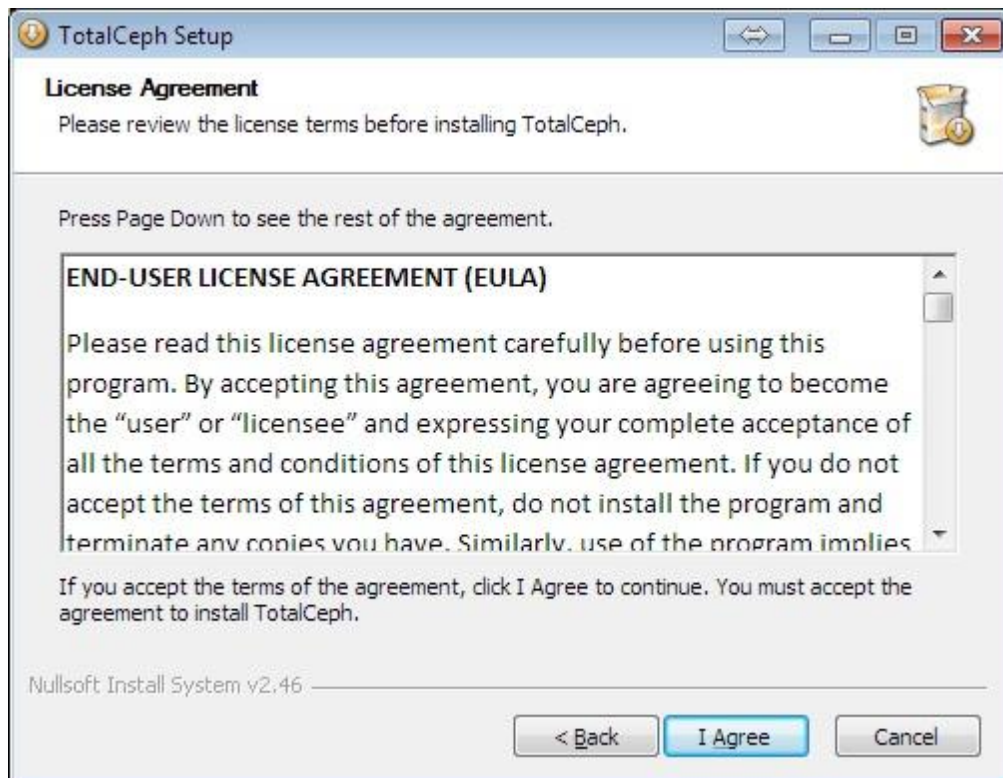
- Installer Language Selection Windows is shown. Select the language you want to use during installation and press Ok.



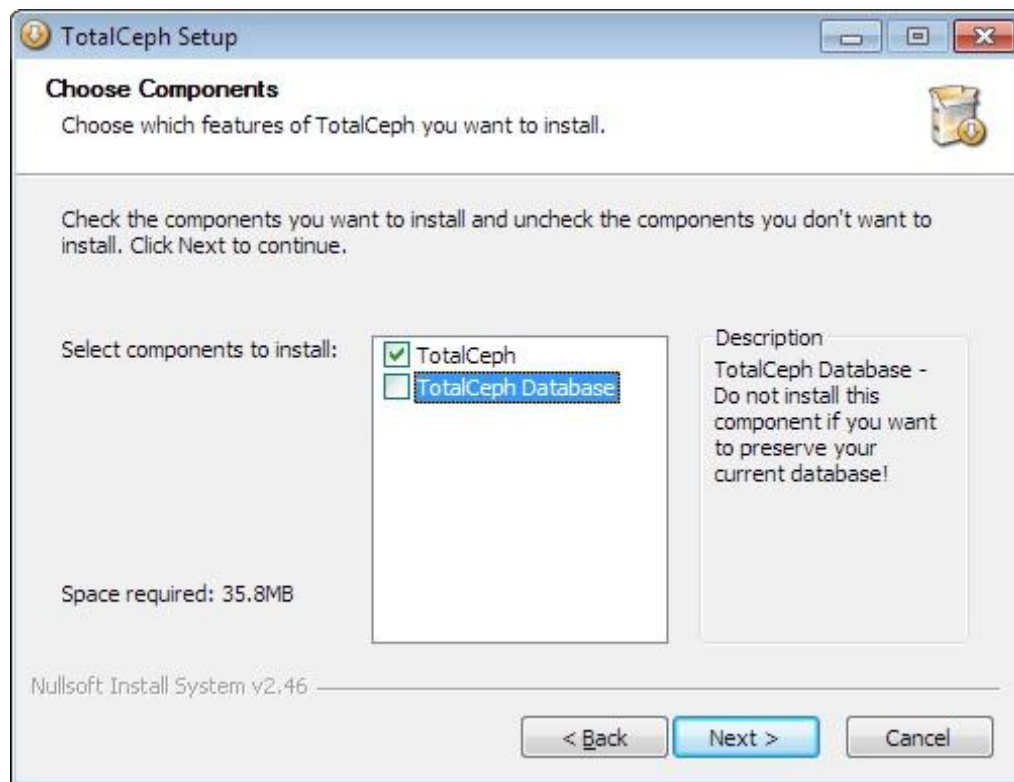
- TotalCeph Setup Wizard is shown.



- Press **Next** button. **License Agreement** is shown.



- Read License Agreement and press **I Agree** button. **Choose Components** Windows is shown.

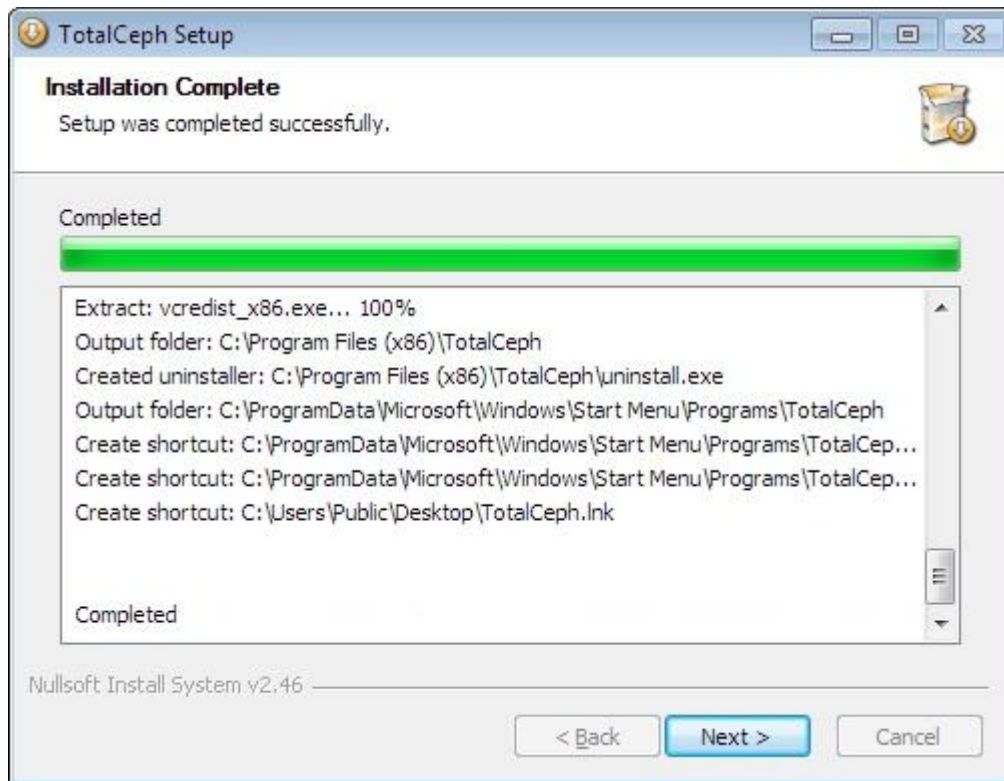


- Select the components and press **Next** button.
- **Attention:** If you are reinstalling or upgrading and want to keep present patient information uncheck **TotalCeph Database**.

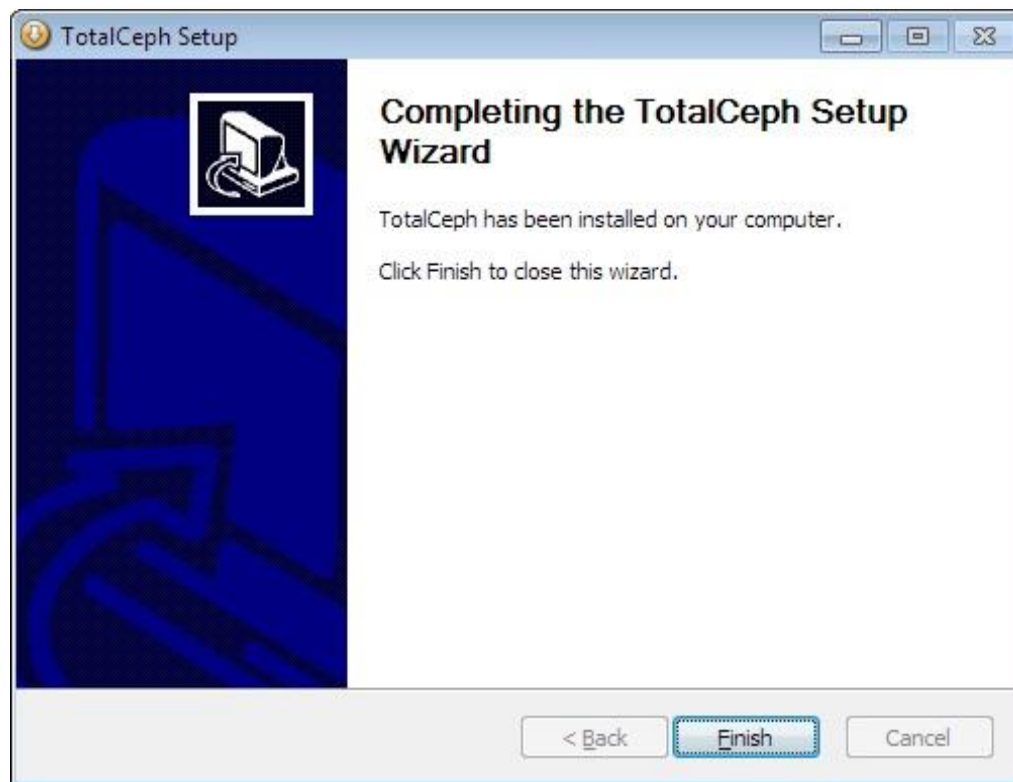
- Choose **Start Menu Folder** Windows is shown.



- Press **Install** button and start installation. If the installation is performed without any errors, the window displayed below is shown.



- Press **Next** button. Setup Completion Window is shown.



- Press **Finish** button and finish installation.



## Mac OS X Installation

For installation of TotalCeph on Mac OS X Operating Systems please follow the steps listed below.

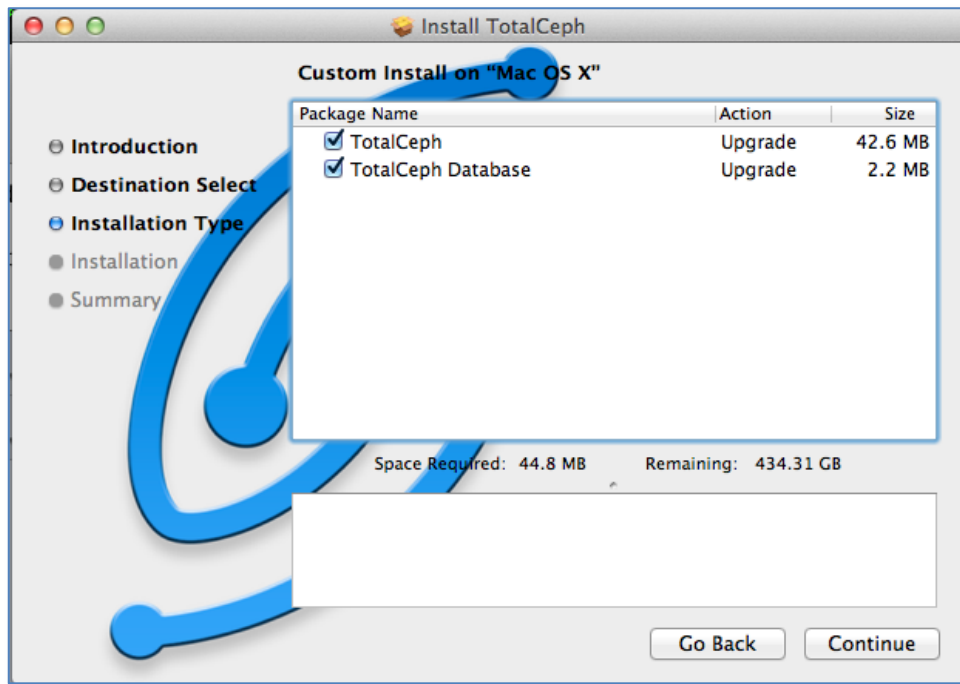
- Open TotalCeph.dmg file, downloaded from TotalCeph web site.
- From the folder opened run TotalCeph.mpkg setup package. The following window is shown.



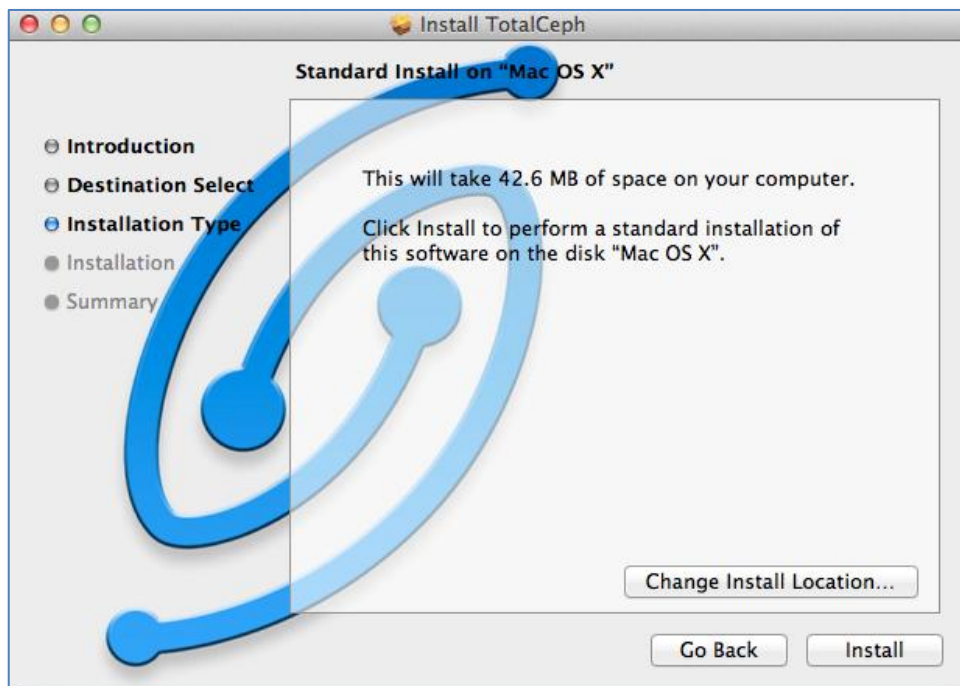
- Press **Continue** button. Install destination selection window is shown.



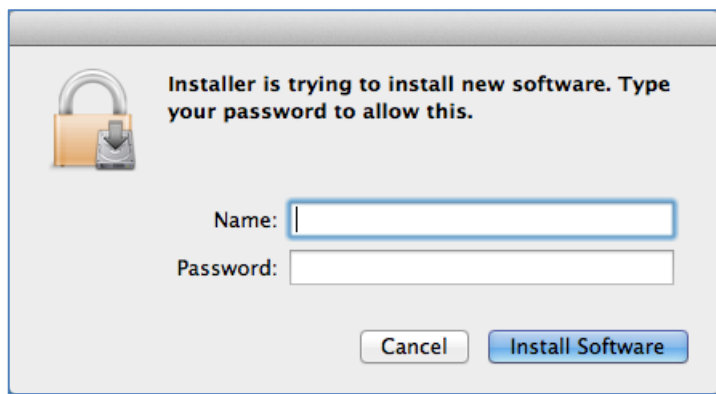
- Press **Continue** button. For selection of components to install the following window is shown.



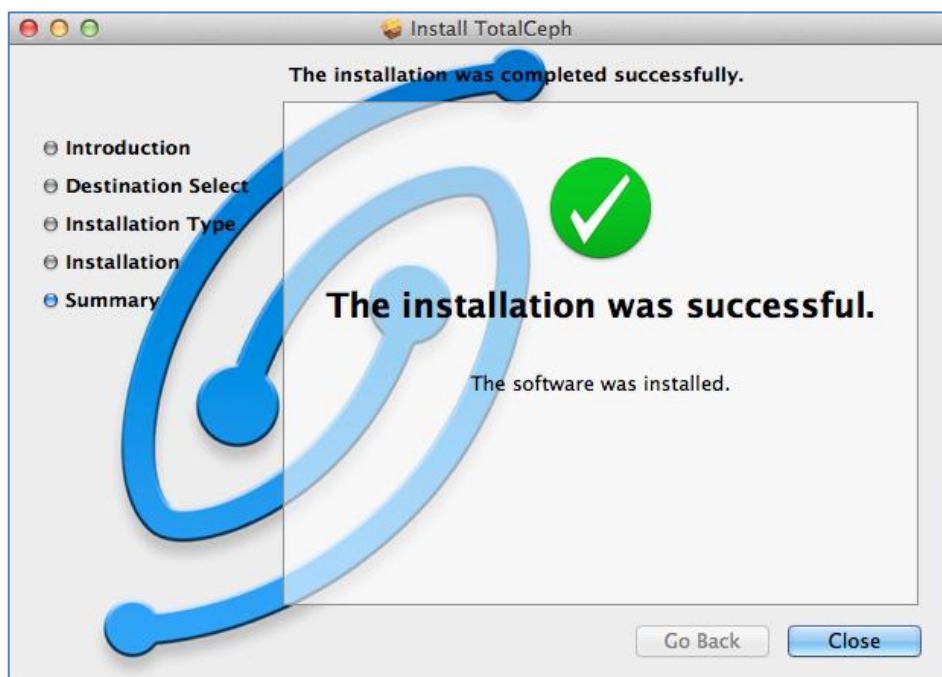
- Select the components and press **Continue** button.
- **Attention:** If you are reinstalling or upgrading and want to keep present patient information uncheck **TotalCeph Database**. The disk usage for the installation of selected components is shown as given below.



- Press **Install** button. For gaining administrator privileges the following window is shown.



- Enter required information and press **Install Software** button. If installation is performed successfully then the following window is shown.



## License Activation

After finishing installation successfully, license activation process should be completed to be able to use TotalCeph application. **In order to activate TotalCeph successfully, there should be an Internet connection on your computer.** When TotalCeph is started for the first time, License Activation window is shown to start license activation process.



License Activation

 **TOTALCEPH**

First Name:  Last Name:

Organization:

Address:

City:  Zip Code:

E-mail:  Phone:

License:

All fields should be filled in the License Activation window, including the license key sent to you. Then, press **Activate** button. “License activation successful” message appears if the activation is successful, and then TotalCeph starts and Image storage folder selection window is shown.

Otherwise failure reason is shown to the user as a warning and the application exits. If **Cancel** button is pressed, user is warned that application will not run unless **License Activation** is performed and then application exits.

**Note:** All fields in the form above are required.

## *User Manual*

Detailed information about all windows present in TotalCeph application is given in this section. Main windows that form the application is listed below:

- [TotalCeph Main Window](#)
- [Image Loader Window](#)
- [Image Explorer Window](#)
- [Cephalometric Analysis Window](#)
- [Treatment Simulation Window](#)
- [Superimposition Window](#)
- [Image Comparison Window](#)
- [Combine Image Window](#)

In almost all windows of the application, tool windows' layout and size can be modified by the user. Windows that have tool windows preserve layout and size information and displayed with the last used layout when reopened. This way each user can use the application with a window layout which is set up according to his/her needs.

**Attention:** All measurements, simulations and image processing functions of TotalCeph application are provided to assist the doctors in treatment process. All diagnosis and possible treatments should be based on doctor's knowledge and experience. Since TotalCeph does not provide any treatment that will replace doctor's treatment, all treatment decisions are doctor's own responsibility.

## TotalCeph Main Window

[TotalCeph Main Window](#) provides interface to listing of patient stored in the system, adding/deleting patient from system, application settings. It also provides access to [Image Loader Window](#) for adding images for the current patient and to [Image Explorer Window](#) for listing all images of the current patient.

First Name	Last Name
Berna	Erdoğan
Gökhan	Vural
Ezgi	Vural
Ayşe	Öztürk

**Personal Information**

First Name: Ezgi Last Name: Vural Id: 26

Date of Birth: 01.01.2000 Gender: Female

**Contact Information**

Address:

City:  Zip Code:  E-mail:

Work Phone:  Home Phone:  Cell Phone:

**Treatment Info**





Status: Active Treatment

Class: Class I

**Notes**

Save

## Toolbar and Menu Items

Toolbar Item	Menu Item	Description
	File → New Patient	To add a new patient, <a href="#">Patient Details</a> window is shown.
	File → Save Patient	Changes made to current user are saved to the database.
	File → Delete Patient	Requests user confirmation to delete selected patient from the database. If confirmation is given selected patient is deleted from the database.
	File → Exit	TotalCeph application exists.
	Tools → Options	<a href="#">Options</a> window is shown.
	Help → Help	Online help is shown.
	Help → About TotalCeph	Application version information is shown.
	-	<a href="#">Image Loader Window</a> is shown.
	-	<a href="#">Image Explorer Window</a> is shown.

## Patient List

All patients stored in the database are listed with their first and last names. Patient list column headers can be used to sort the list items. When the application is run patient list is sorted in a way that the most recently created patient is listed on top and the least recently created patient is on the bottom of the list. List can be filtered by the keyword entered on the text field right above the list. Following attributes are shown for the selected patient.

- Personal Information
  - First Name
  - Last Name
  - Date of Birth
  - Gender
- Contact Information
  - Address
  - City
  - Zip Code
  - E-mail
  - Work Phone
  - Home Phone
  - Cell Phone
- Treatment Info
  - Status
  - Class
- Notes

## Patient Details

This window is used to add new patient to the database.

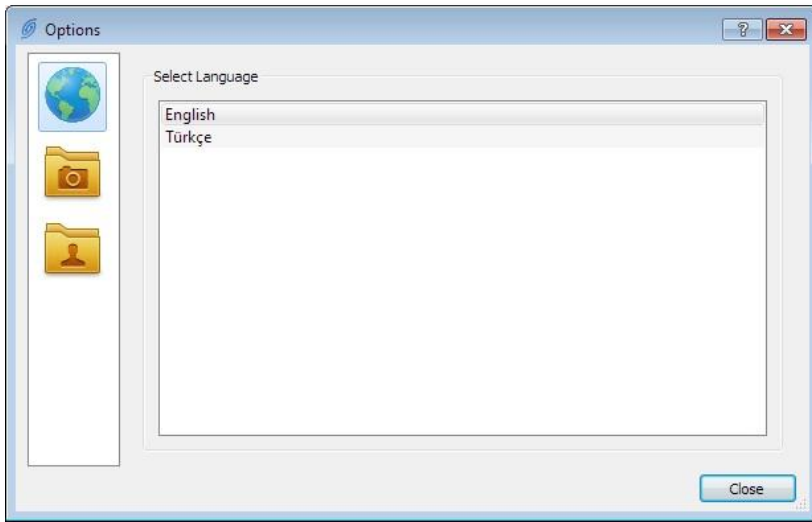
Warning message is shown to the user when Save action is requested while mandatory fields such as First Name, Last Name, Date of Birth is missing. Attributes listed below can be specified for the new patient.

- Personal Information
  - First Name
  - Last Name
  - Date of Birth
  - Gender
- Contact Information
  - Address
  - City
  - Zip Code
  - E-mail
  - Work Phone
  - Home Phone
  - Cell Phone
- Treatment Info
  - Status
  - Class
- Notes

## Options

Setting of application language, patient image storage folder and image series is set through Options window.





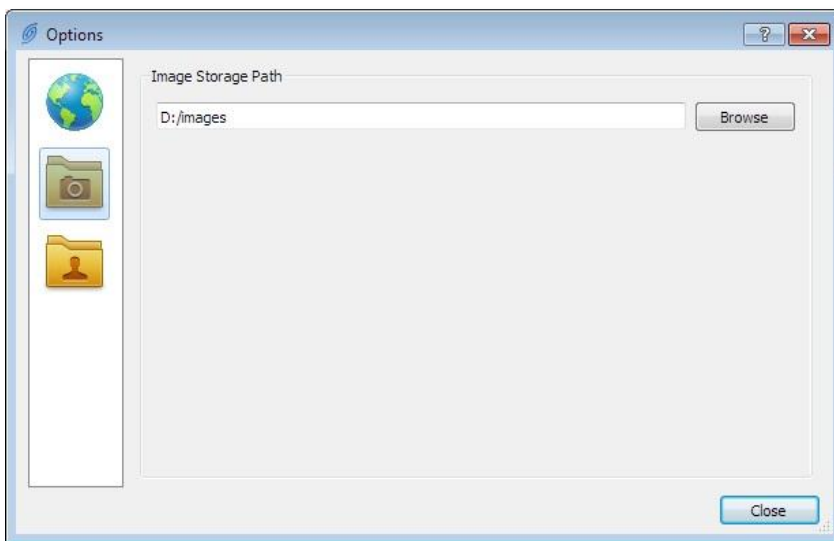
### ***Application Language***

TotalCeph supports the following user interface languages:

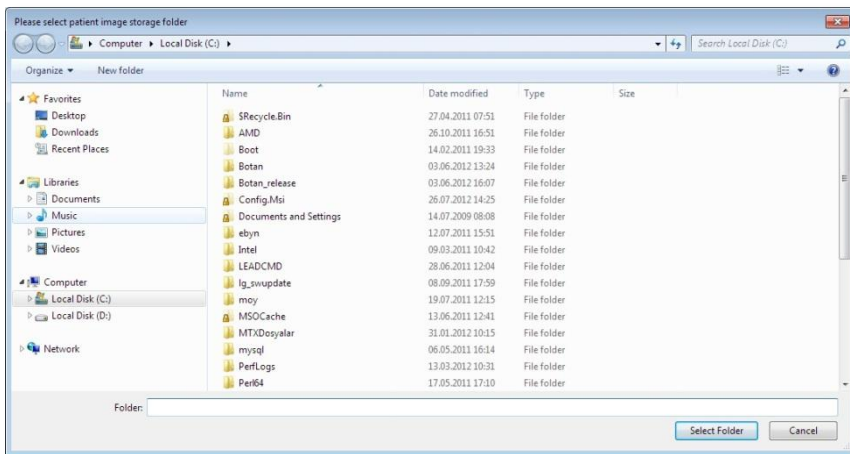
- English
- Turkish

Selected language will be active after the program is restarted.

### ***Image Storage Path***



This settings page is used to set image storage folder that contains the images of patient stored in the database patient images. When image storage folder is changed all files present in the old path is moved to newly selected path. While transferring files if the newly selected folder requires administrator privileges that the current user does not have, warning message is shown and the operation is canceled. In such cases, if you run the application with administrator rights image storage path change operation will be successful. Also when TotalCeph is run for the first time, the window seen below is shown to assist the user to select the image storage folder. **Note:** Folder Selection window is provided by the operating system, so its appearance may vary in different versions of Windows and Mac OS X operating systems.

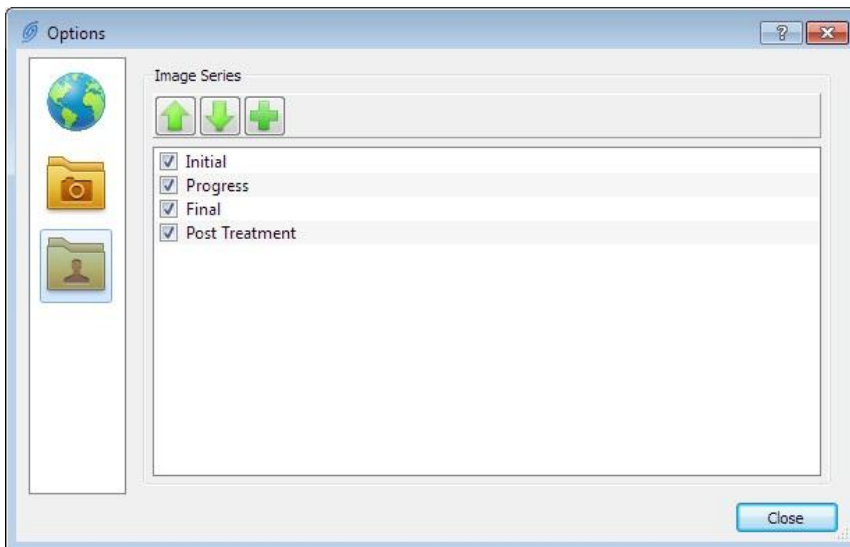




## Image Series

Image Series settings page is used to set image series types. The following types are available by default:

- Initial
- Progress
- Final
- Post Treatment

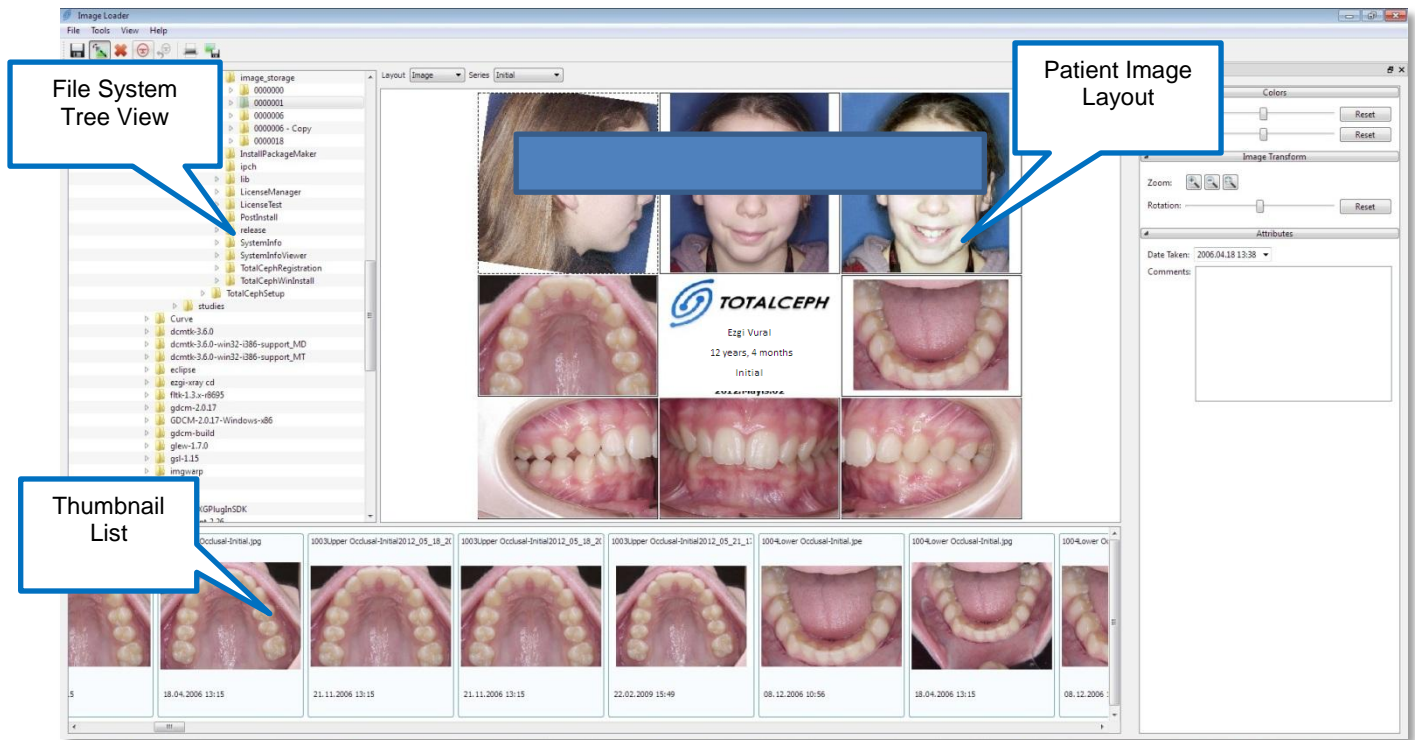
Users can add new image series types and decide which types are used.



With  button a new type is added. A type can be activated and deactivated by the user. With  buttons order of the types can be adjusted.

## Image Loader Window

With this interface images can be imported and saved to the database for the currently selected patient.

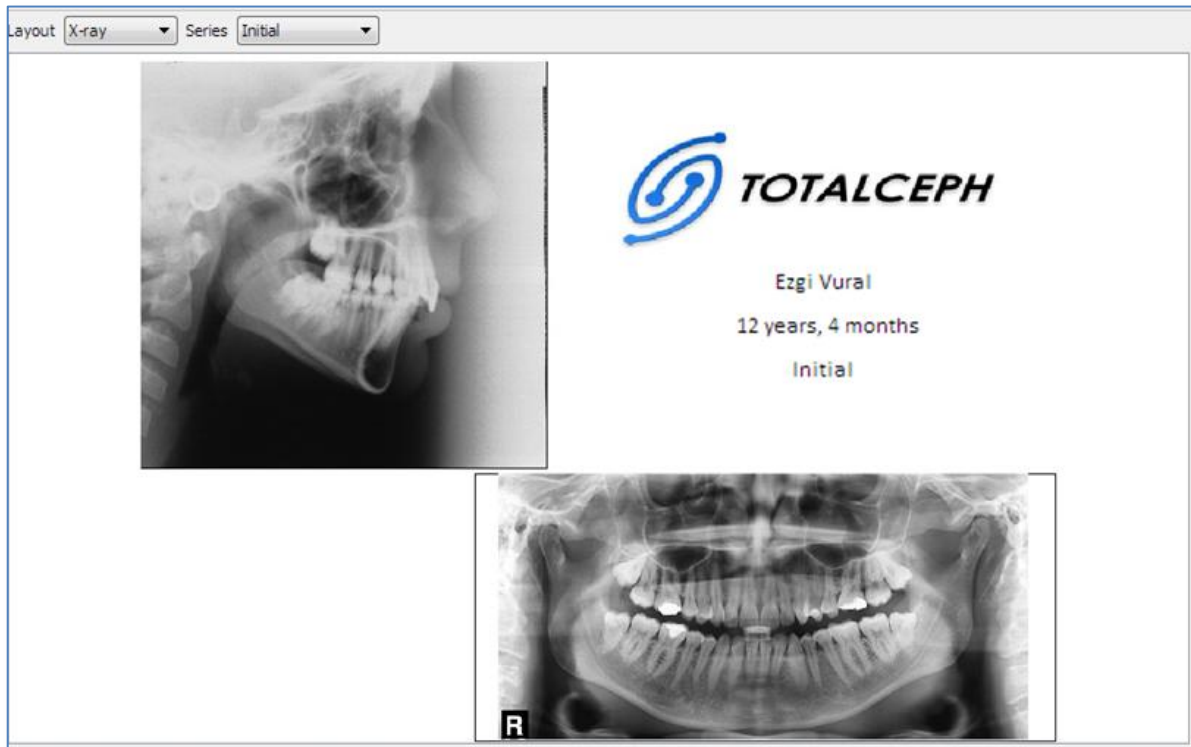


TotalCeph supports standard image file formats (.bmp, .jpg, .png, .tif, etc.). Patient photos and X-Ray images should be in one of those file formats.

## ***Patient Image Layout***

Three different layouts (X-ray, Image and Cast Mixed) are available in this interface. In order to layout images properly guidelines are provided. Blue guidelines are fixed and red guidelines can be moved by using the mouse. When mouse hovers over red guidelines mouse cursor is updated to show possible change directions.

### **X-Ray Layout**



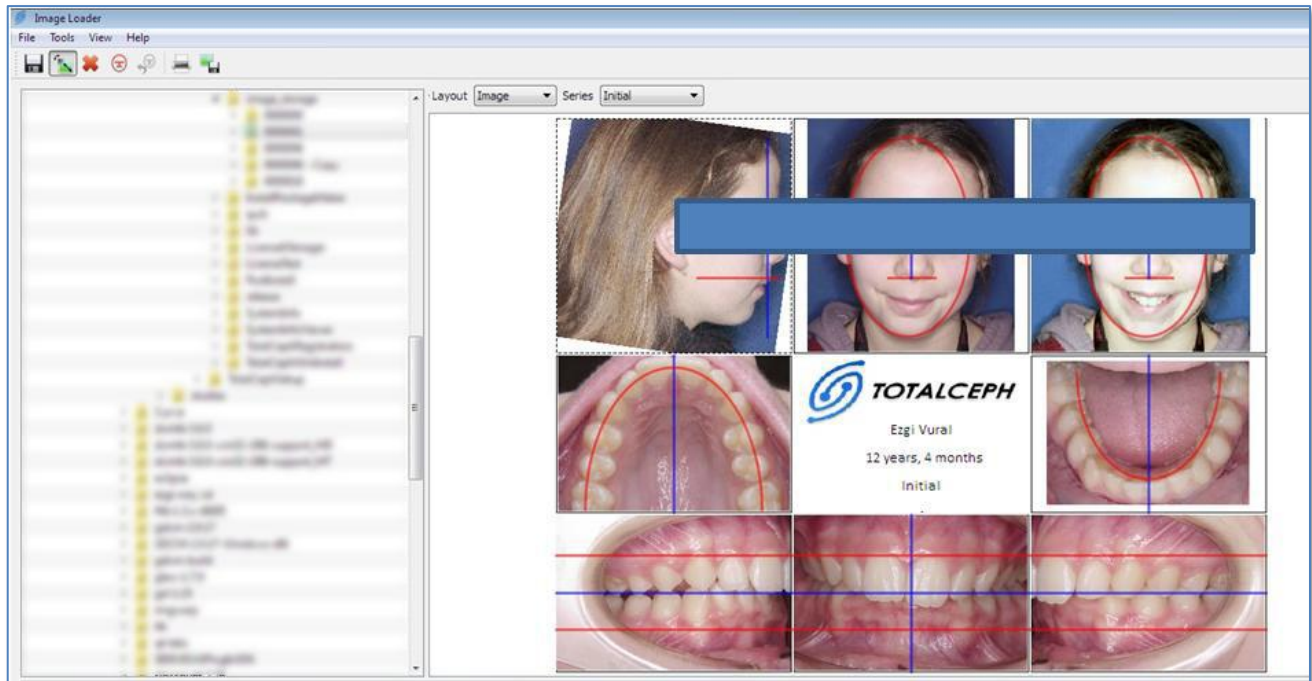
## Cast Mixed Layout



## Image Layout



## Guidelines



### ***File System Tree View***

File System Tre View assists the user in selection of folder that contains images to import. When a folder is selection from tree view thumbnails of all image files with supported file formats are automatically generated and added to thumbnail list.

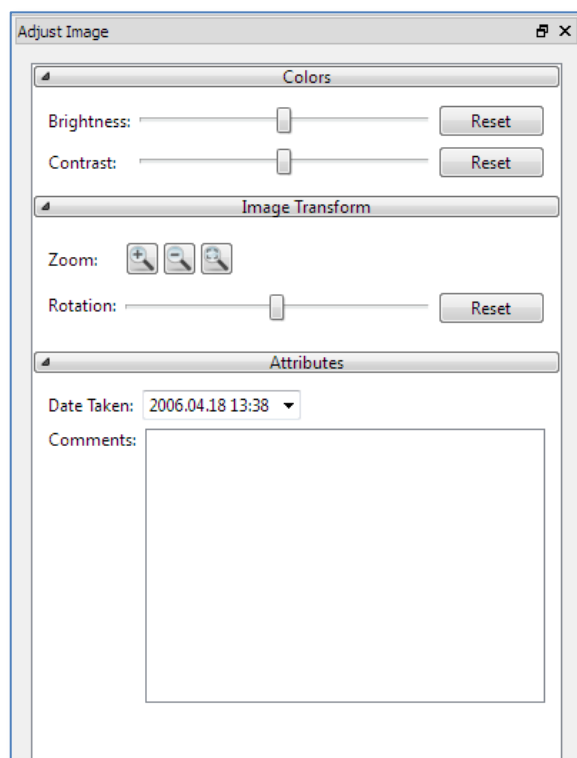
### ***Thumbnail List***

Thumbnails of image files with supported image formats existing in the selected folder are shown in this list. Thumbnails can be dragged via mouse to a desired image type inside patient image layout. Image preview is shown when user double clicks on a thumbnail image.



## Image Settings

Properties of the selected image from [Patient Image Layout](#) can be adjusted via this interface. Brightness/Contrast and zoom level of the image can be adjusted using this tool window. Zoom level adjustment and image placement can also be performed by using mouse. With left mouse button image placement, with right mouse button image rotation and with middle mouse button zoom level adjustment can be done. These operations are performed while specified button is pressed. Also user can take notes about images.

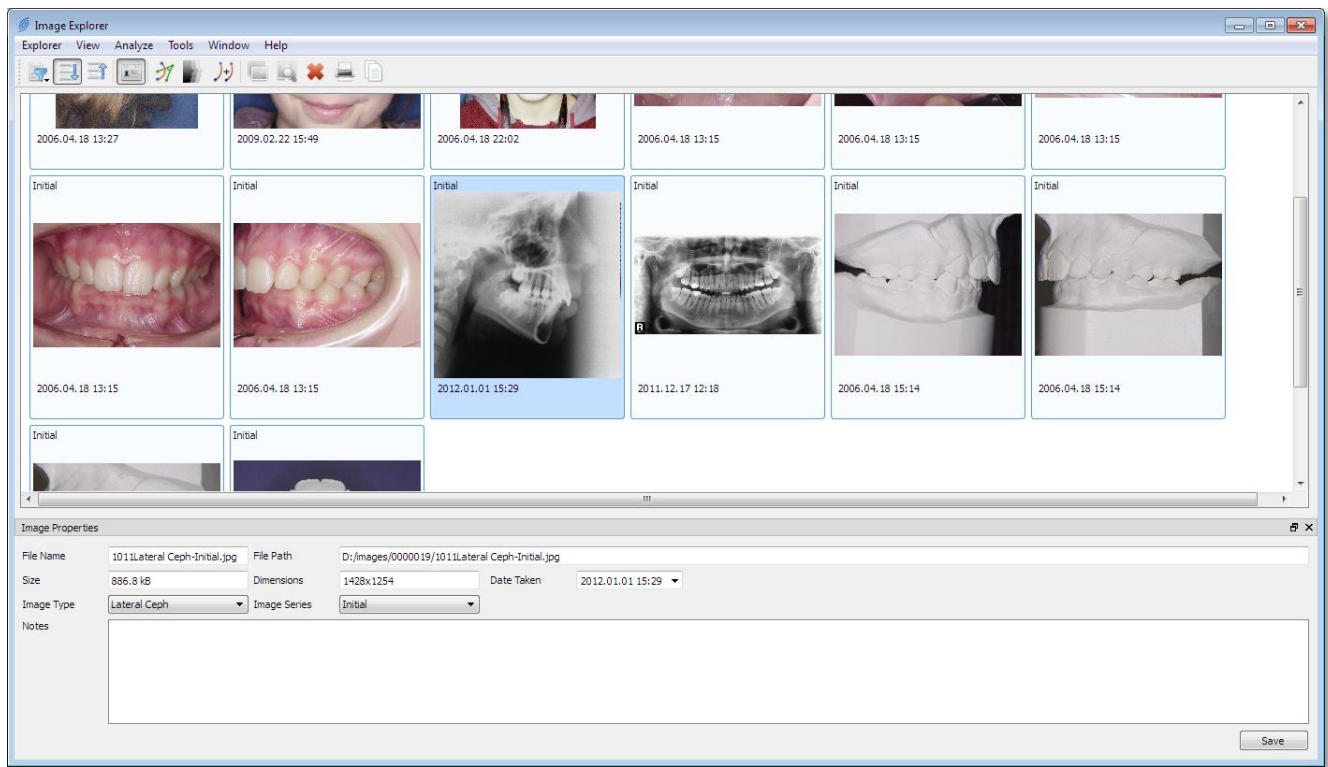


## Toolbar and Menu Items

Toolbar Item	Menu Item	Description
	File → Save	Changed made to patient images are saved to database.
	File → Delete Image	Deletes the selected patient image.
	File → Close	Closes <a href="#">Image Loader Window</a> .
	Tools → Print	To print Patient Image Layout Print Preview Dialog is shown.
	Tools → Save as Image	Patient Image Layout is saved as image. To select file to save, file selection dialog is shown.
	View → Image Properties	<a href="#">Image Settings</a> tool window is shown / hidden.
	View → Guidelines	Guidelines are shown / hidden.
	View → Reset Guidelines	Guidelines are reset to default positions.
	Help → Help	Online help is shown.





## Image Explorer Window

Image Explorer Window displays all images of the currently selected patient in [TotalCeph Main Window](#). It also provides access to cephalometric analysis, treatment simulation, superimposition, image combine, image compare, image copy and deletion.











It is also possible to sort and filter the images. Sorting according to the image series is possible (Initial → Post Treatment, Post Treatment → Initial). Image Preview is displayed when user double clicks a thumbnail image.

## Toolbar and Menu Items

Toolbar Item	Menu Item	Description
	Explorer → Close	Closes window.
	-	Image Filter Menu is shown.
	View → All Images	All images of the current patient are shown.
	View → Images for Cephalometric Analysis	Only images that can be analyzed are shown.
	View → Images for Treatment Simulation	Only images that are suitable for treatment simulation are shown.
	View → Sort By Series First to Last	Sorts patient images according to series first to last.
	View → Sort By Series Last to First	Sorts patient images according to series last to first.
	Analyze → Cephalometric Analysis	<a href="#">Cephalometric Analysis Window</a> is shown. For ceph, panoramic ceph, PA ceph, lateral photo, frontal photo, frontal photo (smile), right



		occlusion, left occlusion, anterior occlusion, model upper occlusal, model lower occlusal, model right buccal, model left buccal, model anterior buccal images this button is enabled, otherwise it is disabled. Please refer to <a href="#">Cephalometric Analysis Window</a> help section for more information.
	Analyze → Treatment Simulation	Enabled when a lateral ceph image is selected. <a href="#">Treatment Simulation Window</a> is opened.
	Analyze → Superimposition	Enabled when a lateral ceph image is selected. <a href="#">Superimposition Window</a> , which enables user to superimpose different data of the patient, is opened.
	Tools → Combine Images	Enabled when a lateral ceph and a lateral photo image is selected together. <a href="#">Combine Image Window</a> is opened.
	Tools → Compare Images	Enabled when any two images are selected together. <a href="#">Image Comparison Window</a> is opened.
	Tools → Copy Image	Selected image is copied. (Can be pasted to other applications such as image editors.)
	Tools → Delete Image(s)	After getting confirmation from the user selected images are deleted from database.
	Tools → Print Images(s)	Print Preview Dialog is shown to print selected images.
	Window → Image Properties	<a href="#">Image Properties</a> tool window is shown / hidden.
	Help → Help	Online help is shown.

## Image Properties

Properties of the selected image are displayed in this tool window. These properties are listed below:

- File Name,
- File Path,
- File Size,
- Image Dimensions,
- Image Type,
- Image Series,
- Date Taken,
- Notes.

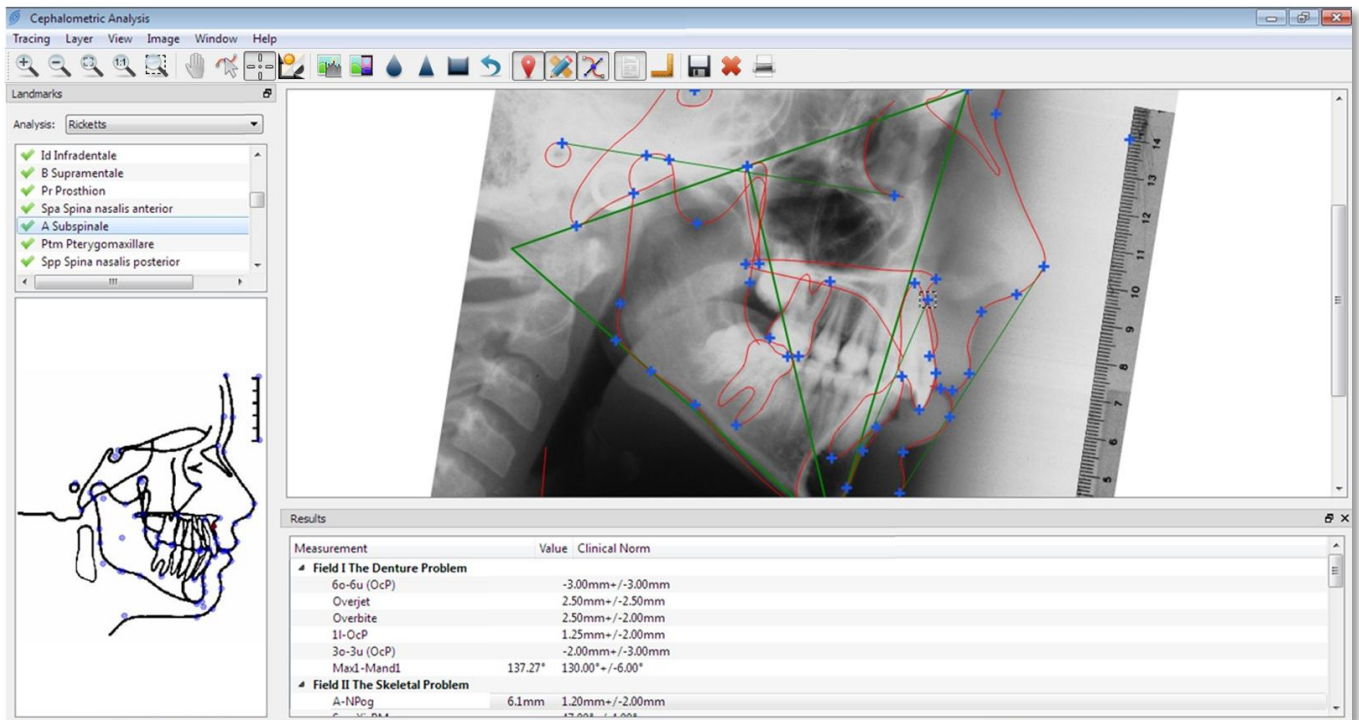
It is possible to change image type and series type using this interface. Supported image types are given below. Analysis is not possible for all types given in the list below. Some types are included for future versions.

- Lateral(right)
- Frontal
- Frontal Smile
- Upper Occlusal
- Lower Occlusal
- Right Occlusion

- Anterior Occlusion
- Left Occlusion
- Over Jet
- Right Oblique
- Left Oblique
- Lateral Ceph
- PA Ceph
- Panoramic
- Rt. TMJ
- Lt. TMJ
- SMV
- Model Upper Occlusal
- Model Lower Occlusal
- Model Right Buccal
- Model Anterior Buccal
- Model Left Buccal
- Left Hand
- Right Hand
- Cast Deciduous Dentition
- Cast Permanent Dentition
- Cast Mixed Dentition
- Compare
- Composition

## Cephalometric Analysis Window

Cephalometric Analysis Window enables user to analyze ceph, photo and cast model images by using landmarks. Results of the selected analysis method are shown both numerically and graphically.



## Supported Analysis

### Lateral Photo

- Epker & Fish
- Legan & Burstone
- Lip
- Rakosi
- Schwarz
- Tübingen

### Frontal Photo

- Divine Proportion
- Symmetry
- Tübingen

### Frontal Photo (smile)

- Golder Ruler

### Lateral Ceph

- Aachen
- Bergen/Hasund
- Berlin
- Bern

- Burstone Craniofacial
- Burstone Profile
- Clark Correlative
- Clark Linear
- Denture Frame
- Downs
- Downs (International)
- Dual Plane
- Epker & Fish
- Frankfurt
- Freiburg
- Harvold
- Heidelberg
- Holdaway
- Innsbruck
- Jarabak Dental
- Jarabak Skeletal
- Legan & Burstone
- Lip
- Mc Gann
- Mc Laughlin
- Mc Namara
- Munster
- Oslo
- Profile
- Rakosi Incisor
- Rakosi Metric
- Rakosi Sagittal
- Rakosi Vertical
- Ricketts
- Ricketts Short
- Riedel
- Roth - Jarabak
- Sassouni
- Schmuth
- Schwarz Craniometric
- Schwarz Gnathometric
- Steiner
- Tweed
- Zurich

### ***PA Ceph***

- Munster
- Ricketts

### ***Panaromic Ceph***

- Implant Survey

### ***Cast Deciduous Dentition***

- Tübingen

***Cast Permanent Dentition***

- Arc Length
- Korkhaus
- Muhlberg
- Linder & Harth
- Lundstrom
- Pont
- Supporting Zone
- Symmetry
- Weise

***Cast Mixed Dentition***

- Ballard-Wylie
- Berendonk
- Carey
- Droschl
- Huckaba
- Korkhaus
- Linder & Harth
- Muhlberg
- Muller
- Pont Index
- Tanaka
- Tonn
- Weise

***Landmarks***

Landmarks tool window contains analysis list view, landmarks list view (list of landmarks that should be located by user, or located by the application using located landmarks) and a sketch view that guides the user in location landmarks.

Landmark list view is automatically updated when analysis selection is changed. Although they are applied to same type of images, required landmarks for each analysis may vary. Landmarks already located are preserved when analysis selection is changed.

When a landmark is selected from the landmark list, all measurements affected directly or indirectly by the selected landmark is highlighted. Also when right mouse button is clicked on a selected landmark, a menu is shown which enables to delete the selected or all landmarks in the list.

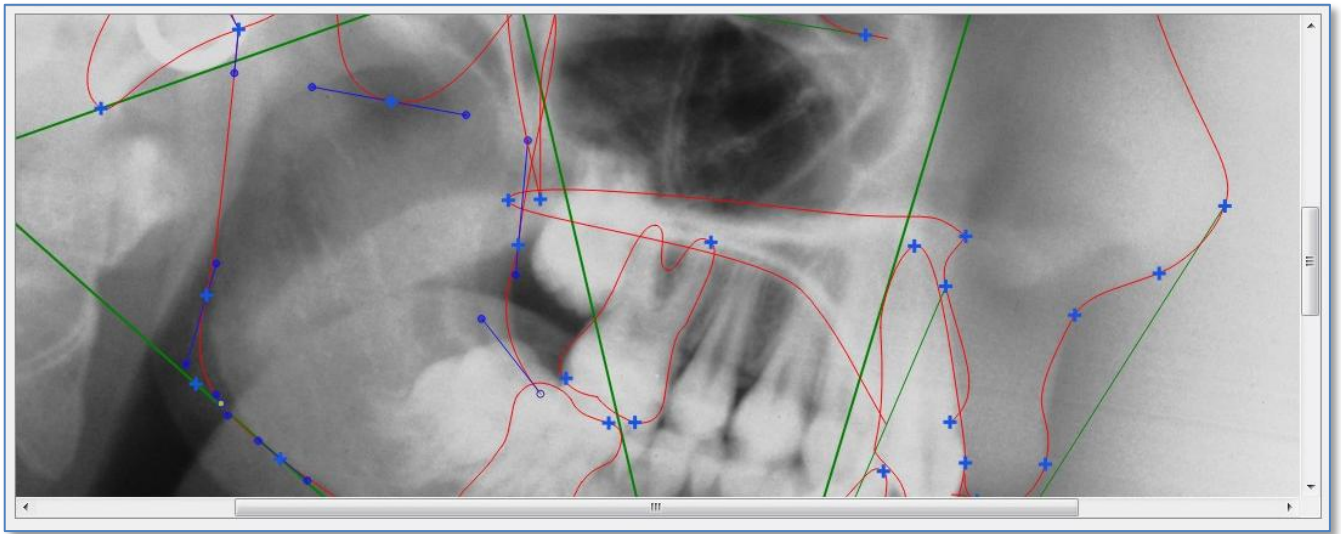
To guide the user in locating landmarks a sketch view is shown. All landmarks are displayed with blue color and only currently selected landmark is displayed with red color in sketch view

***Viewer***

Viewer displays all graphical objects that are related with the landmarks, measurements, templates and analysis graphics. To locate a landmark on an image first a landmark should be selected from landmark list. When viewer is in "Place Landmarks" mode, landmarks are placed by clicking left mouse button once. Landmarks that are located before can be relocated by using left mouse button when viewer mode is "Select/Move". When position of a landmark is changed all related measurements, graphics and templates are automatically updated. Similarly when analysis selection is changed analysis graphics are automatically updated. Templates are automatically positioned according to the landmarks's positions. To avoid miscalculations these templates should be manually fine tuned

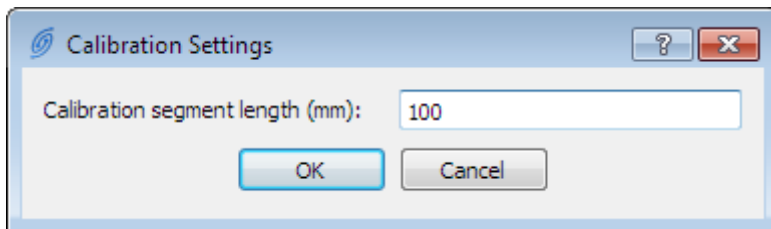
by the user. Also in “Select/Move” mode when user clicks a template, selected template become activated and control points of the Bezier curve forming the template become visible.

### Active Template



### Calibration Settings

















Measurements defined in analyses that compute distance between certain positions require image to be calibrated. For calibrating the image two points should be placed with exactly calibration segment length distance from each other. Default calibration segment length is defined as 100 millimeters. User can change calibration segment length for current image using Calibration Settings tool window.









### Results

Measurements related with the selected analysis and clinical norm values of these measurements are shown in this tool window.

## Toolbar and Menu Items

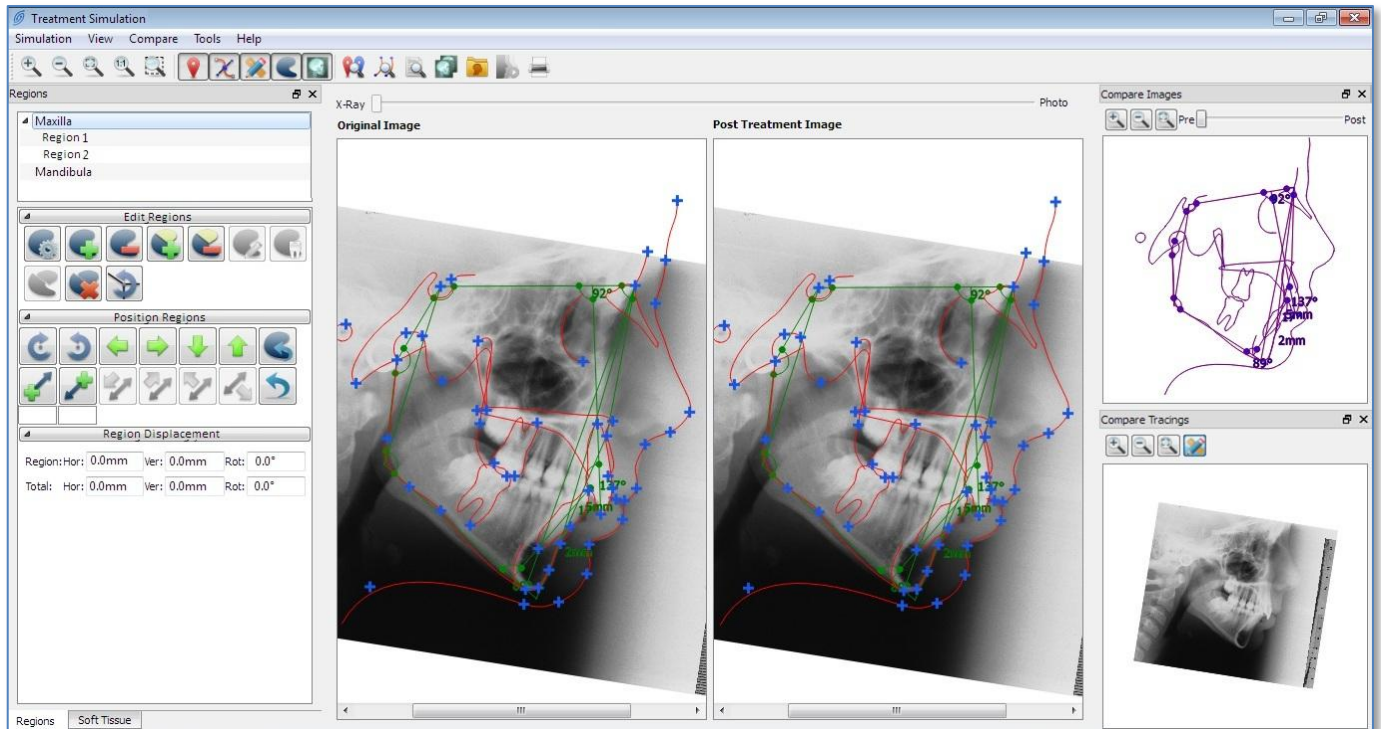
Toolbar Item	Menu Item	Description
	Tracing → Save	Saves tracing data to database. Tracing includes landmark positions, template definitions and data related with the selected analysis.
	Tracing → Print Report	Shows Report Preview dialog with current tracing and measurements.
	Tracing → Close	After prompting user for saving data closes <a href="#">Cephalometric Analysis Window</a> .
	Layer → Landmarks	Shows / hides landmarks layer in viewer.
	Layer → Templates	Shows / hides templates layer in viewer.
	Layer → Graphic	Shows / hides analysis graphics layer in viewer.
	View → Zoom In	Zooms in to the image in viewer.
	View → Zoom Out	Zooms out from the image in viewer.
	View → Fit to Window	Adjusts the zoom level of the viewer so that all objects are visible.
	View → Zoom to Actual Size	Adjusts the zoom level of the viewer so that image is shown with its real resolution.
	View → Magnifier	Shows / hides cursor following magnifier.
	View → Mode → Pan	Sets viewer mode to pan mode. When pan mode is active you can pan with both left and right mouse buttons pressed, without placing landmarks or editing tracing.
	View → Mode → Select/Move	Sets viewer mode to select mode. When select mode is active you can select and relocate landmarks or select templates and reshape them by moving Bezier curve control points.
	View → Mode → Place Landmarks	Sets viewer mode to edit tracing mode. When edit tracing mode is active you can position landmarks with left Mouse button and pan with right mouse button.
	Image → Adjust Brightness/Contrast	Activates brightness/contrast adjustment mode. With left mouse button pressed, by moving mouse up and down brightness can be increased and decreased, also by moving mouse right and left contrast can be increased and decreased.
	Image → Grayscale Inversion	Performs grayscale inversion to all pixels of the image. Black pixels become white and white pixels become black.
	Image → Histogram Equalization	Performs histogram equalization process. This will enhance the image with low contrast and assist use to distinguish pixels easily.

	Image → Smooth Image	To suppress the noise in image, smoothing is performed.
	Image → Sharpen Image	To enhance edges in the image, sharpening is performed.
	Image → Shaded Relief	Produces a shaded relief from image to help user in visualizing structural components of image.
	Image → Reset Changes	Görüntüye uygulanan tüm işlemler kaldırılarak görüntü orijinal halı ile gösterilir.
	Window → Results	<a href="#">Results</a> tool window is shown / hidden.
	Window → Calibration Settings	<a href="#">Calibration Settings</a> is opened.
	Help → Help	Online help is shown.



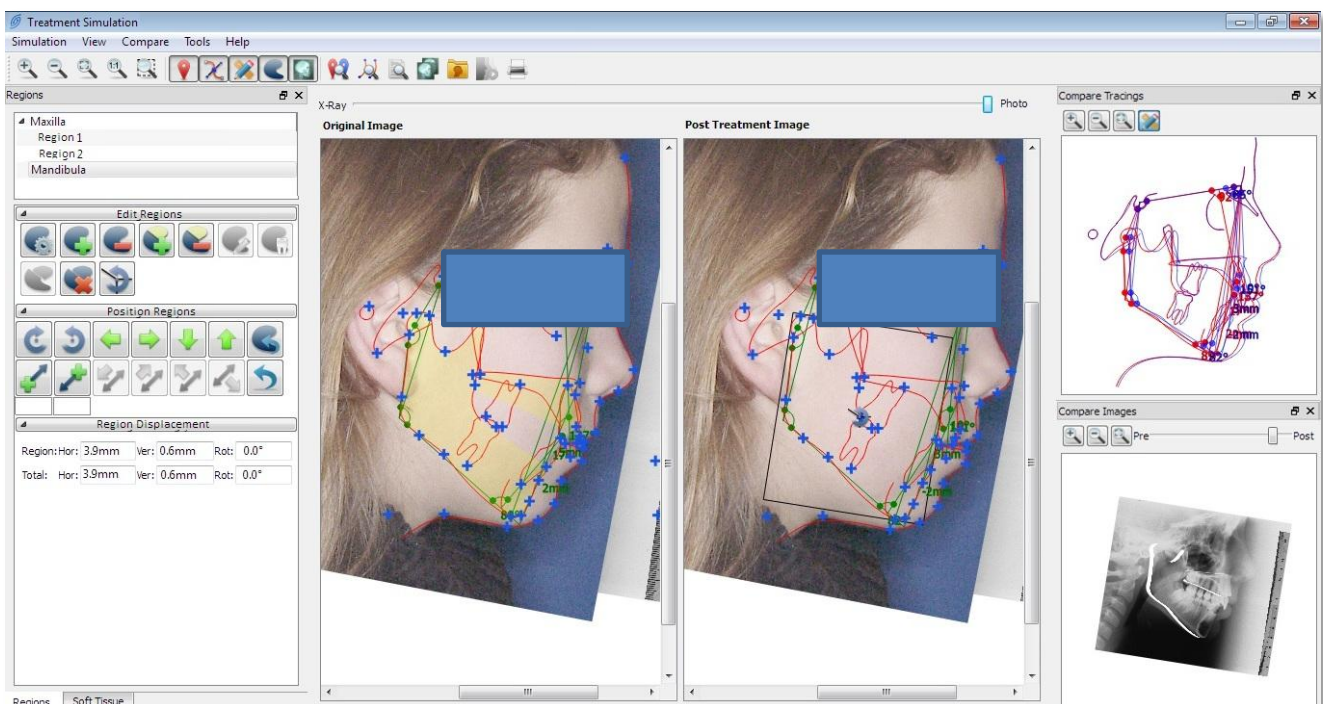
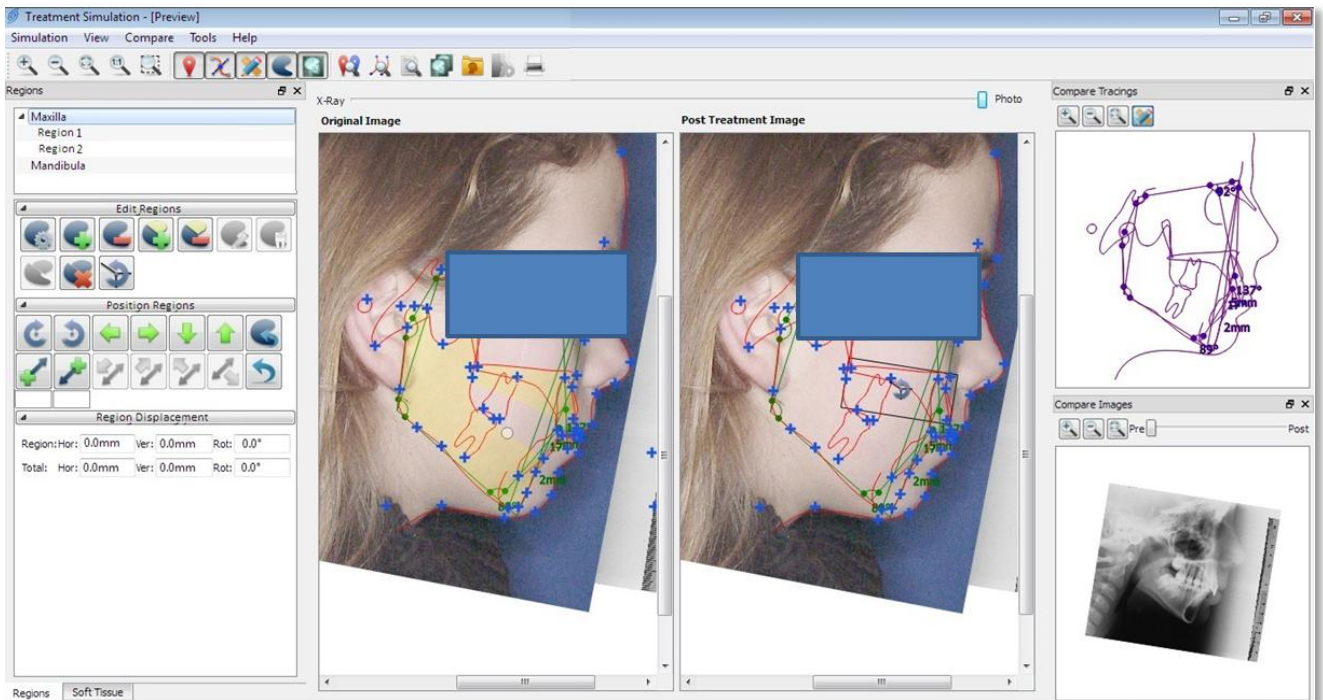
## Treatment Simulation Window

Treatment Simulation Window provides interface to perform treatment simulation on already analyzed lateral ceph images including soft tissue simulation. During simulation analysis results of original image and analysis results of simulation image can be compared both visually and numerically. To open treatment simulation window a lateral ceph image should be selected from [Image Explorer Window](#). If positions of all required landmarks are not set for the selected image user is warned and treatment simulation window is closed.



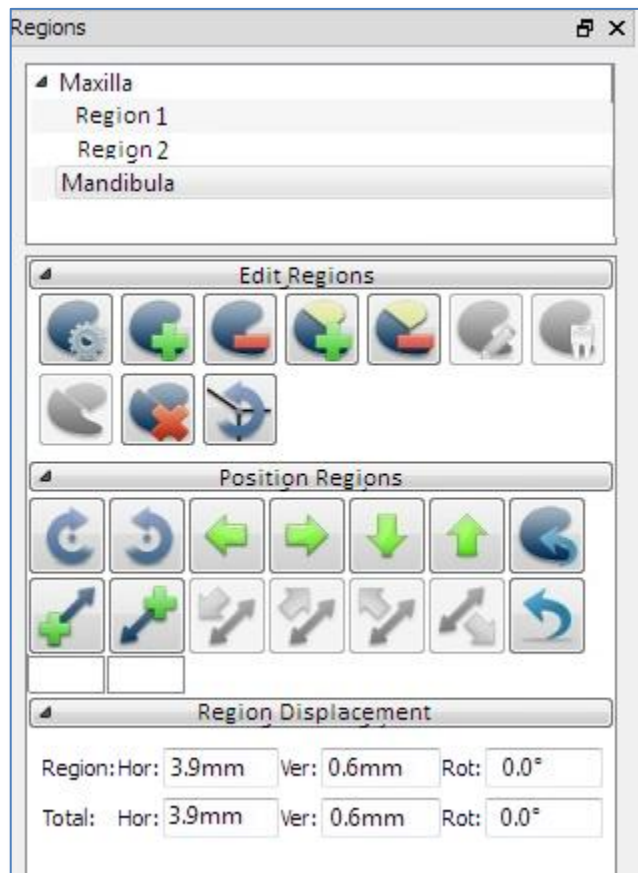
## Viewer

Original and simulation images and all graphic objects related with these images are displayed in this component. Visibility of images and layers are controlled by the toolbar and menu items. If loaded lateral photo can also be displayed together with lateral cephal image. Transparency of images can be adjusted by slider control above images. Profile template of simulation image can be adjusted as in [Cephalometric Analysis Window](#). Selected region (either from region tree view or from viewer) is displayed with different color. Rotation center of selected region is also displayed with an icon on top of region.








## Regions






Region definition, positioning regions can be performed using this tool window. This interface consists of Region Tree View, Edit Regions, Position Regions and Region Displacement components.

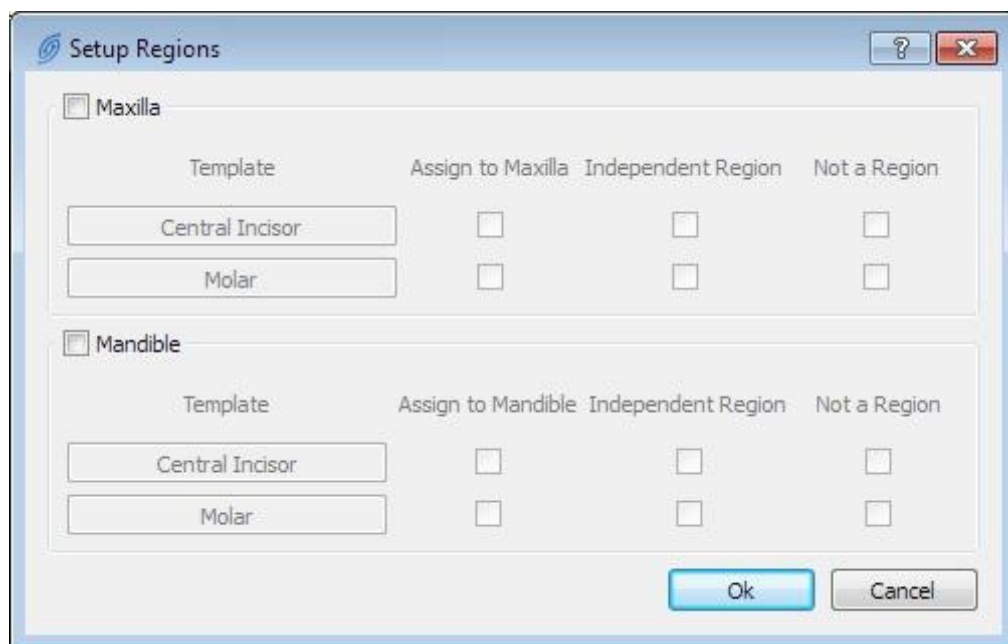


## Edit Regions

This component provides tools for creating and editing regions which are used in simulation.

Tool	Description
 Setup Regions	To setup region definition Setup Regions dialog is shown. Using this dialog user can set how maxilla, mandible, incisor and molar tooth is defined. Maxilla and mandible can be defined as independent regions. Also with the decision of user incisor and molar tooth can be defined as independent regions or bound to maxilla and mandible main regions. When Setup Regions is shown user is warned that current region definition will be reset.
 Create Region	To create and add a new main region, template list view is shown. If user does not select an item from the list an empty region is created. With Add Sub Region sub regions can be added to the new main region.
 Delete Region	Deletes selected region from Region Tree View. All transformation applied on this region is reset to original state.
 Add Sub Region	Current mode is set to add sub region to the selected main region from region tree view. Sub regions can be added by using templates or manually from image.
 Remove Sub Region	Current mode is set to remove sub region from the selected main region from region tree view. To remove sub regions freehand region selection or select region from template should be active.

 Freehand Region Selection	This tool is user to add sub region to or remove sub region from selected main region. Region selection is performed by moving left mouse button while it is pressed and selection is finalized when mouse button is released.
 Select Region from Template	This tool is user to add sub region to or remove sub region from selected main region. When add sub region mode is active template list populated with unused templates is shown. And when remove sub region mode is active template list populated with used templates in selected region is shown. When removed all transform applied to sub region is reset.
 Create Cut	Create Cut mode is activated. This tool is enabled when a region with no cuts is selected from region tree view. To create a cut on original image cut line should be defined with left mouse button while left mouse button is pressed. After cut process is performed region is divided into two regions. These regions can be moved independently and also they can be moved together. When a region with a cut is selected from region tree view cut line is displayed on original image with a gray line.
 Delete Cut	This tool is enabled when a region with a cut is selected from region tree view. When delete cut operation is performed two sub regions forming the main region is merged and relative transform of sub regions is reset.
 Set Center of Rotation	Mode is set to setting center of rotation of selected region from region tree view. Selection of rotation center is performed with left or right mouse button on original image. When left mouse button is used nearest landmark to click position is selected and when right mouse button is used clicked position is selected.



The **Setup Regions** dialog box is used to configure the assignment of dental templates to the Maxilla and Mandible regions. It contains two main sections: **Maxilla** and **Mandible**. Each section has a list of templates (Central Incisor and Molar) and three checkboxes to assign them: **Assign to [Region]**, **Independent Region**, and **Not a Region**. The **Maxilla** section is currently selected, and the **Mandible** section is also visible. The **Ok** and **Cancel** buttons are at the bottom right.

Region	Template	Assign to Region	Independent Region	Not a Region
Maxilla	Central Incisor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Molar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mandible	Central Incisor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Molar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## Position Regions

Provides transform, rotate and reset tools for selected region from region tree view.

Tool	Description
 Rotate Clockwise	Selected region is rotated clockwise around region rotation center.
 Rotate Counterclockwise	Selected region is rotated counter clockwise around region rotation center.
 Move Left	Selected region is moved one defined displacement unit to left.
 Move Right	Selected region is moved one defined displacement unit to right.
 Move Down	Selected region is moved one defined displacement unit to down.
 Move Up	Selected region is moved one defined displacement unit to up.
 Set Line Start	Mode is set to setting of displacement line start point. When this mode is active with a left mouse button click on original image sets displacement line start point. This point is displayed with a yellow circle on original image.
 Set Line End	Mode is set to setting of displacement line end point. When this mode is active with a left mouse button click on original image sets displacement line end point. This point is displayed with a yellow circle on original image. When both end points of displacement line is set line is displayed with a yellow line.
 Move To Start	Selected region is moved one defined displacement unit to start point of displacement line.
 Move To End	Selected region is moved one defined displacement unit to end point of displacement line.
 Move Orthogonally Up	Selected region is moved one defined displacement unit orthogonally up from displacement line.
 Move Orthogonally Down	Selected region is moved one defined displacement unit orthogonally down from displacement line.
 Reset Region	All transform operations performed on selected region are reset. If selected region is a sub region of a region with cut, only relative transform of sub region is reset.
 Reset All Regions	Reset all regions in region tree view to initial positions and transforms.

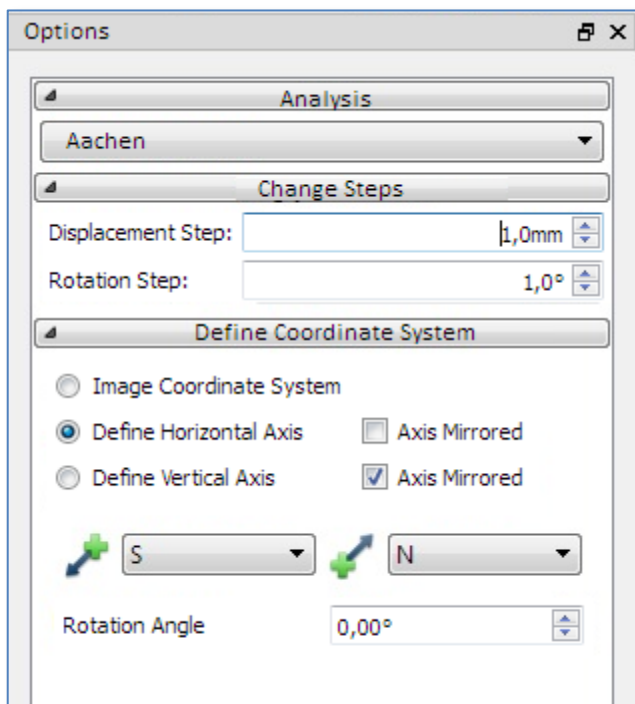


## Region Displacement

Total and relative displacement data of selected region is displayed in this interface. Displacements are measured according to the displacement unit and coordinate system defined in [Options](#) tool window.

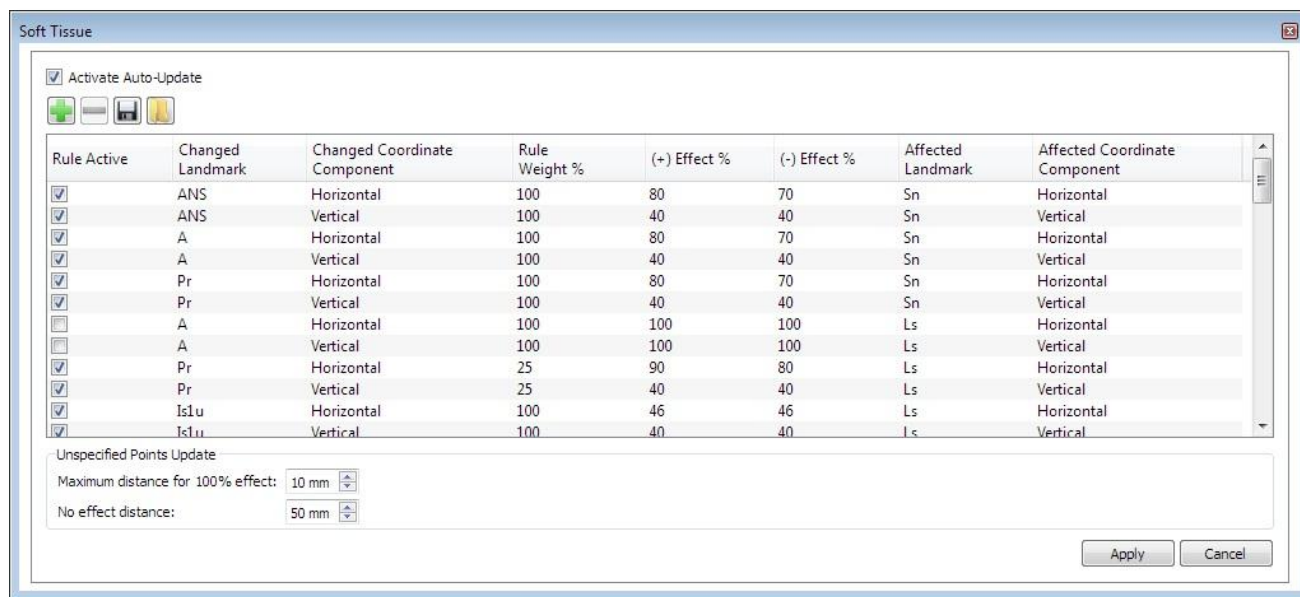
## Options

Analysis usage, displacement and rotation unit definition and coordinate system definition can be done via this interface. Graphics objects are automatically updated when current analysis selection is changed. Similarly graphics in Compare Tracings viewer and measurements in Compare Results tool window are automatically updated upon analysis change. Default displacement change unit is 1 mm and its maximum is defined as 100 mm. Default rotation change unit is 1 degree. To define coordinate system which is used in computing displacements of regions and landmarks several options are available. Image coordinate system can be used directly. Also by selecting two landmarks one axis of coordinate system can be defined, so that other axis is perpendicular to it. Direction of the positive axis is also selectable by user.







## Soft Tissue

Controls how soft tissue simulation is performed. In soft tissue simulation rules defining how changes of landmarks in horizontal and vertical axis will affect landmarks on profile template is used. Standard rule set is provided with the application. Also user can define new rule sets using this interface.



Since a landmark can be affected by more than one landmark, rules are applied according to their weights. Rules can be defined in chains. For example landmark a affects landmark b and landmark b affects landmark a. However cyclic rule definition is prevented and user is warned to fix rule set when such cycles are detected.

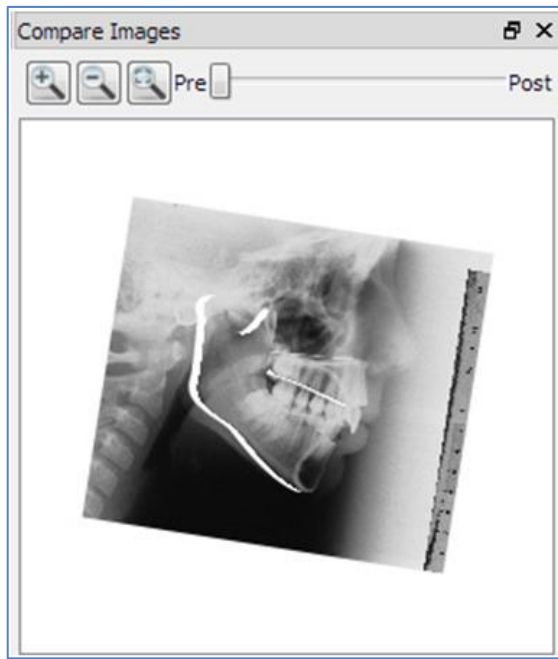
Tool	Description
Activate Auto-Update	When this item is checked rules are applied automatically when regions are transformed.
	Adds a new rule to the end of rule set.
	Deletes selected rule from the rule set.
	To save rule set soft tissue rule set list is shown. User can select an existing rule set to update (except standard) or create a new rule set by selecting last item from list. Names of list items can be changed by user.
	To load an existing rule set soft tissue rule set list is shown. If a rule set is selected from the list shown all unsaved changes made to current rule set will be discarded.
Apply	Applies rule set.
Cancel	Cancels changes made to the rule set.

## Unspecified Points Update

Simulation of soft tissue landmarks with no related rules is defined via this interface. By using maximum distance for 100 % effect and no effect distance and near landmarks simulated with rules soft tissue landmarks with no related rules are simulated. Changes from near landmarks within maximum distance for 100 % effect are applied directly. This effect is linearly decreased to null till no effect distance is reached for near landmarks.

## Compare Images

Original and simulation images are superimposed in this viewer. Transparency of the images can be adjusted using the slider control inside the toolbar of this tool window.

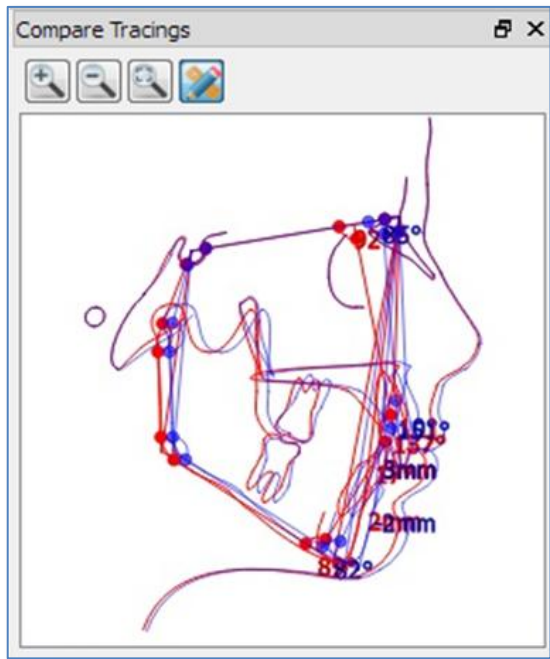






Toolbatr Item	Description
	Zooms in to scene in Compare Images viewer.
	Zooms out of the scene in Compare Images viewer.
	Adjusts the zoom level of Compare Images viewer so that scene is fit inside.



## Compare Tracings

Tracings from original and simulation images are superimposed on this viewer. It is possible to show / hide analysis graphics.



Toolbar Item	Description
	Zooms in to scene in Compare Tracings viewer.
	Zooms out of the scene in Compare Tracings viewer.
	Adjusts the zoom level of Compare Tracings viewer so that scene is fit inside.
	Shows / hides analysis graphics inside the scene.

## Compare Landmarks

Horizontal, vertical and total displacement values are listed according to the coordinate system defined in Options tool window. Sorting is possible when left mouse button is clicked on the desired column title.





Landmark	Hor. Displacement	Ver. Displacement	Total Displacement
Pr Prosthion	3.95mm	0.64mm	4.00mm
Spa Spina nasalis anterior	3.95mm	0.64mm	4.00mm
A Subspinale	3.95mm	0.64mm	4.00mm
Ptm Pterygomaxillare	3.95mm	0.64mm	4.00mm
Spp Spina nasalis posterior	3.95mm	0.64mm	4.00mm
Ap1o Apicale des oberen Einsers	3.95mm	0.64mm	4.00mm
1UpMma mesialer Apex d. OK-Sechsters	3.95mm	0.64mm	4.00mm
NormA Normierungspunkt A	0.00mm	0.00mm	0.00mm
NormB Normierungspunkt B	0.00mm	0.00mm	0.00mm
Gl Glabella	0.00mm	0.00mm	0.00mm
N Nasion	0.00mm	0.00mm	0.00mm
S Sellamitte	0.00mm	0.00mm	0.00mm
Se Mitte des Sellaeingangs	0.00mm	0.00mm	0.00mm
Cond Condylion	0.00mm	0.00mm	0.00mm
P Porion	0.00mm	0.00mm	0.00mm
hPCond dorsalster Punkt des Condylion	0.00mm	0.00mm	0.00mm
Ba Basion	0.00mm	0.00mm	0.00mm
ar Artikulare	0.00mm	0.00mm	0.00mm

## Compare Results

Analysis results together with clinical normal values are listed for both original and simulation images.

Measurement	Value	Clinical Norm	Post Value	Post Clinical Norm	Difference
ANB	5.46°	2.00°	9.49°	2.00°	4.03
<b>2. Dentale Diagnose</b>					
OK1-SN	91.80°	102.00°	84.98°	102.00°	-6.82
1o-NPog	12.4mm	2.00mm...7.00mm	12.4mm	2.00mm...7.00mm	0.0
UK1-MeGo	89.13°	92.50° +/- 2.50°	89.13°	92.50° +/- 2.50°	0.00
1u-NPog	5.4mm	0.00mm...5.00mm	5.4mm	0.00mm...5.00mm	0.0
UK1-APog	17.41°	22.00° +/- 3.00°	13.40°	22.00° +/- 3.00°	-4.01
1u-APog	1.7mm	1.00mm +/- 0.50mm	-0.6mm	1.00mm +/- 0.50mm	-2.3
Overjet	8.0mm	2.00mm	8.0mm	2.00mm	0.0
Overbite	5.9mm	2.00mm	5.9mm	2.00mm	0.0
Interincisal	137.27°	125.00°...130.00°	144.09°	125.00°...130.00°	6.82

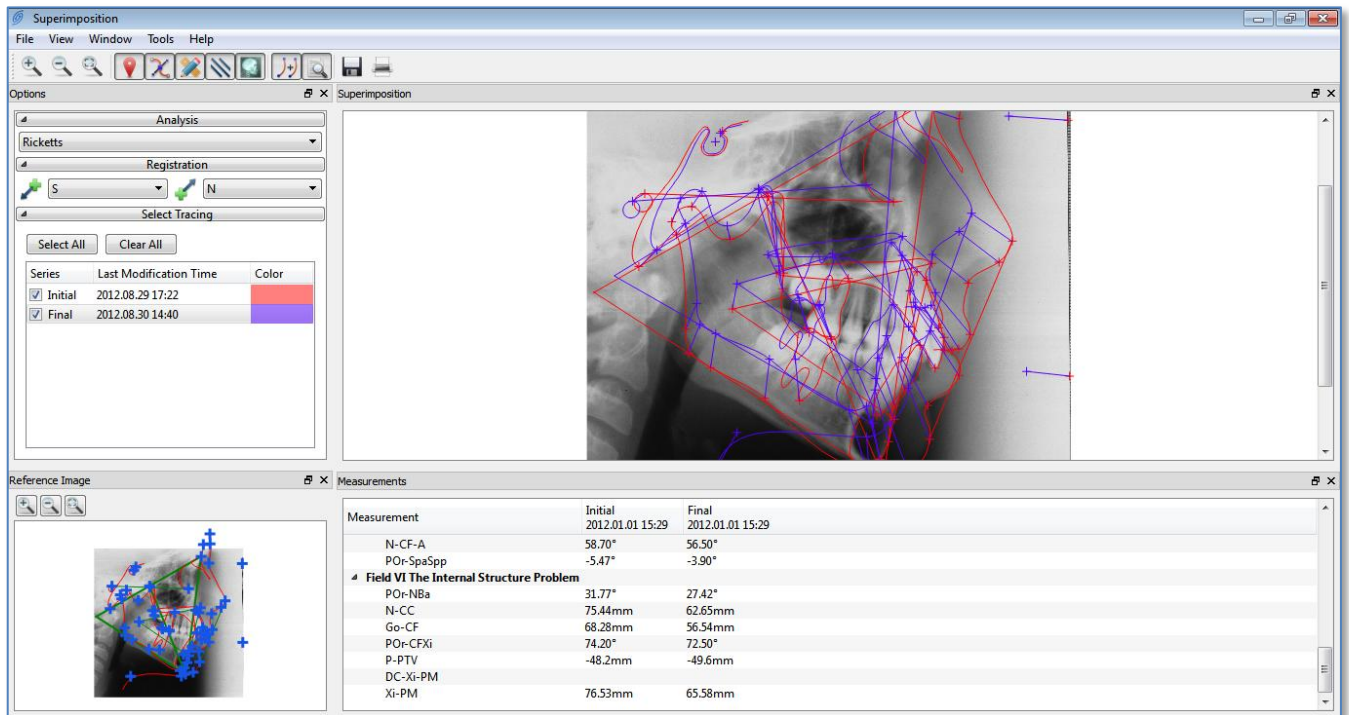
## Toolbar and Menu Items

Toolbar Item	Menu Item	Description
	Simulation → Save X-Ray Simulation	X-ray simulation result image, analysis results and all landmark, tracing and template data is saved to the database.
	Simulation → Save Photo Simulation	If lateral photo is used during simulation photo simulation result image, analysis results and all landmark, tracing and template data is saved to the database.
	Simulation → Load Photo	To load lateral photo image selection view is shown.
	Simulation → Compute Result	This tool when lateral photo is loaded and successfully registered to X-Ray image. Computes

		possible effects of transforms of regions to the soft tissue and computes a possible post treatment simulation result of patient's lateral photo.
	Simulation → Print Report	Shows Report Preview dialog with original and simulation tracing, images and measurements.
	Simulation → Close	<a href="#">Treatment Simulation Window</a> is closed.
	View → Zoom In	Zooms in to the image in viewer.
	View → Zoom Out	Zooms out from the image in viewer.
	View → Fit to Window	Adjusts the zoom level of the viewer so that all objects are visible.
	View → Zoom to Actual Size	Adjusts the zoom level of the viewer so that image is shown with its real resolution.
	View → Magnifier	Shows / hides cursor following magnifier.
	View → Layer → Landmarks	Shows / hides landmarks layer in viewer.
	View → Layer → Templates	Shows / hides templates layer in viewer.
	View → Layer → Graphics	Shows / hides analysis graphics layer in viewer.
	View → Layer → Regions	Shows / hides region layer in viewer.
	View → Layer → Image	Shows / hides X-ray and photo images in viewer.
	Compare → Landmarks	<a href="#">Compare Landmarks</a> tool window is shown / hidden.
	Compare → Tracings	<a href="#">Compare Tracings</a> tool window is shown / hidden.
	Compare → Results	<a href="#">Compare Results</a> tool window is shown / hidden.
	Compare → Images	<a href="#">Compare Images</a> tool window is shown / hidden.
	Tools → Regions	<a href="#">Regions</a> tool window is shown / hidden.
	Tools → Soft Tissue	<a href="#">Soft Tissue</a> tool window is shown / hidden.
	Tools → Options	<a href="#">Options</a> tool window is shown / hidden.
	Help → Help	Online help is shown.

## Superimposition Window

This interface enables user to superimpose different tracings from different lateral ceph images of the same patient and compare them. This tool is enabled when a single lateral ceph image is selected from patient image list in [Image Explorer Window](#).

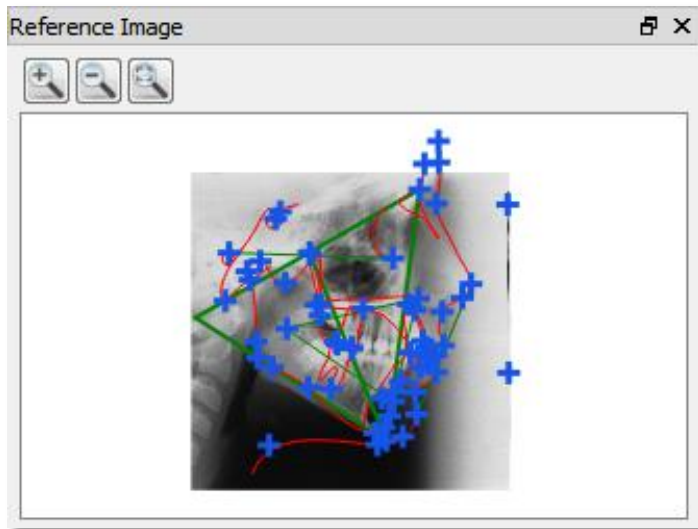





## Superimposition

This component displays landmarks, templates and analysis graphics on reference image according to selection of tracings. Selection of tracings to display is chose from [Options](#) tool window. Display of graphics objects from selected tracings is adjusted using toolbar and menu items.

## Reference Image

Reference image used in superimposition is displayed in this interface together with tracing graphics.



Toolbar Item	Description
	Zooms in to scene in Reference Image viewer.
	Zooms out of the scene in Reference Image viewer.
	Adjusts the zoom level of Reference Image viewer so that scene is fit inside.

## Measurements

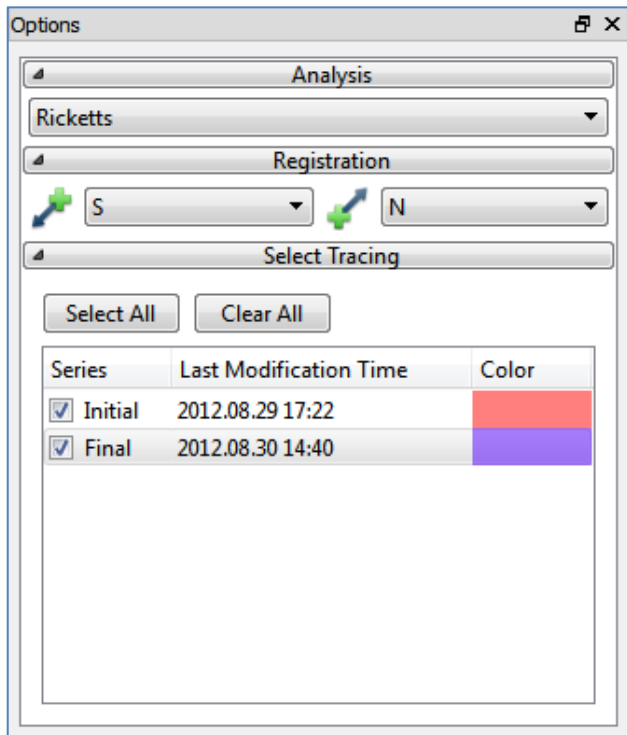
Results of analysis measurement of selected tracings are displayed in this interface.

Measurements		
Measurement	Initial 2012.01.01 15:29	Final 2012.01.01 15:29
N-CF-A	58.70°	56.50°
POr-SpaSpp	-5.47°	-3.90°
<b>Field VI The Internal Structure Problem</b>		
POr-NBa	31.77°	27.42°
N-CC	75.44mm	62.65mm
Go-CF	68.28mm	56.54mm
POr-CFXi	74.20°	72.50°
P-PTV	-48.2mm	-49.6mm
DC-Xi-PM		
Xi-PM	76.53mm	65.58mm

## Options

### Analysis

Analysis displayed in [Superimposition](#) viewer, [Reference Image](#) viewer and Measurements tool window is selected using this interface. Upon change of analysis selection all related graphical and numerical data is automatically updated.



### Registration







Selection landmarks used in registration of different tracings is performed via this interface. To register tracing graphics a contact landmark and a direction landmark should be selected. To have a successful registration landmarks surveyed on all tracings should be selected.

### Select Tracing

Tool	Description
Select All	Selects all tracings so that related graphics are displayed on viewers and tabular views.
Clear All	Clears all selection of tracings.




When user double clicks with left mouse button to color column of tracings list to select the color of related tracing graphics in [Superimposition](#) viewer color selection window is shown. (Note: Color Selection Window is provided by the operating system so its appearance is different in Windows and Mac OS X versions.)

**Toolbar and Menu Items**

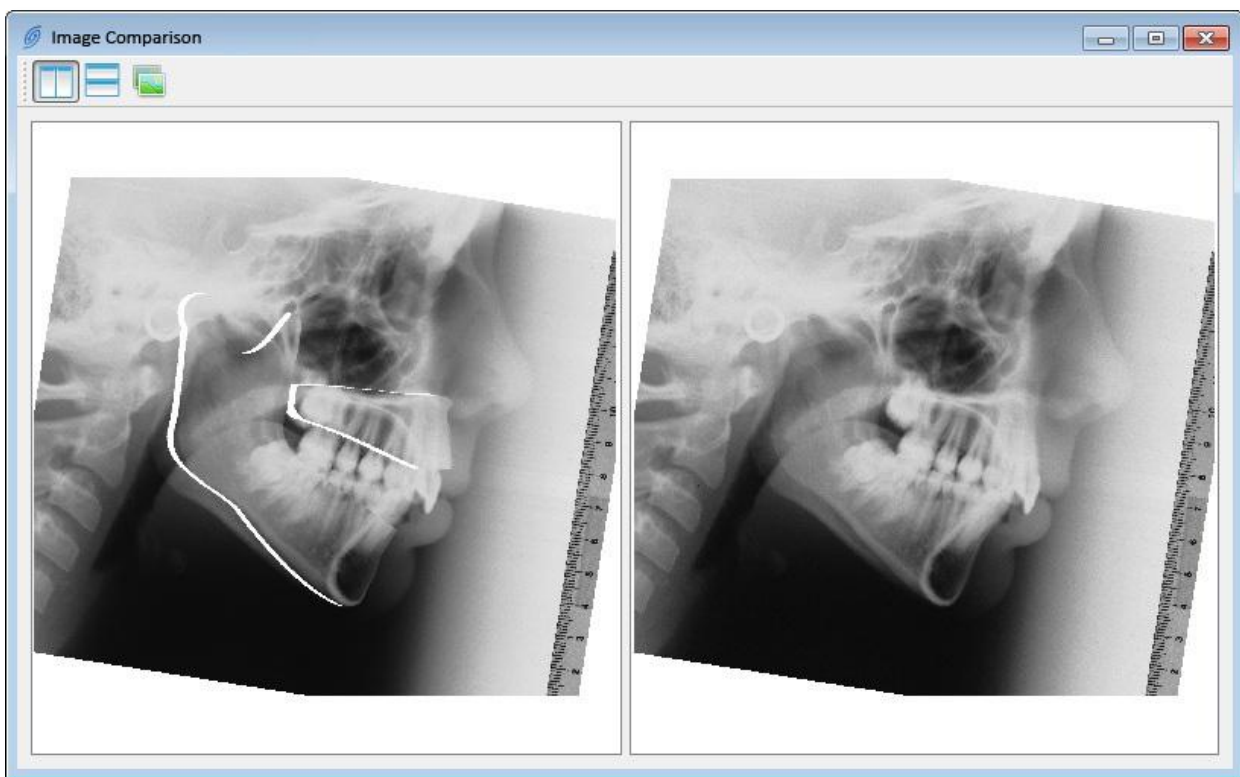
Toolbar Item	Menu Item	Description
	File → Save as Image	Save scene in <a href="#">Superimposition</a> viewer to the database as an image with comparison image type.
	File → Print Report	Shows Report Preview dialog with selected tracings.
	File → Close	<a href="#">Superimposition Window</a> is closed.
	View → Zoom In	Zooms in to the image in viewer.
	View → Zoom Out	Zooms out from the image in viewer.
	View → Fit to Window	Adjusts the zoom level of the viewer so that all objects are visible.
	View → Layer → Landmarks	Shows / hides landmarks layer in viewer.
	View → Layer → Templates	Shows / hides templates layer in viewer.
	View → Layer → Graphics	Shows / hides analysis graphics layer in viewer.
	View → Layer → Transform Lines	Shows / hides transform lines which show horizontal and vertical displacements of reference image landmarks and landmarks of other tracings.
	View → Layer → Image	Shows / hides X-ray image in viewer.
	Window → Superimposition	<a href="#">Superimposition</a> viewer is shown / hidden.
	Window → Measurements	<a href="#">Measurements</a> tool window is shown / hidden.
	Tools → Reference Image	<a href="#">Reference Image</a> tool window is shown / hidden.
	Tools → Options	<a href="#">Options</a> tool window is shown / hidden.
	Help → Help	Online help is shown.

## Image Comparison Window

User can compare two images horizontally, vertically or in single viewer. This interface can be used to compare pre and post treatment images to assess treatment results visually.

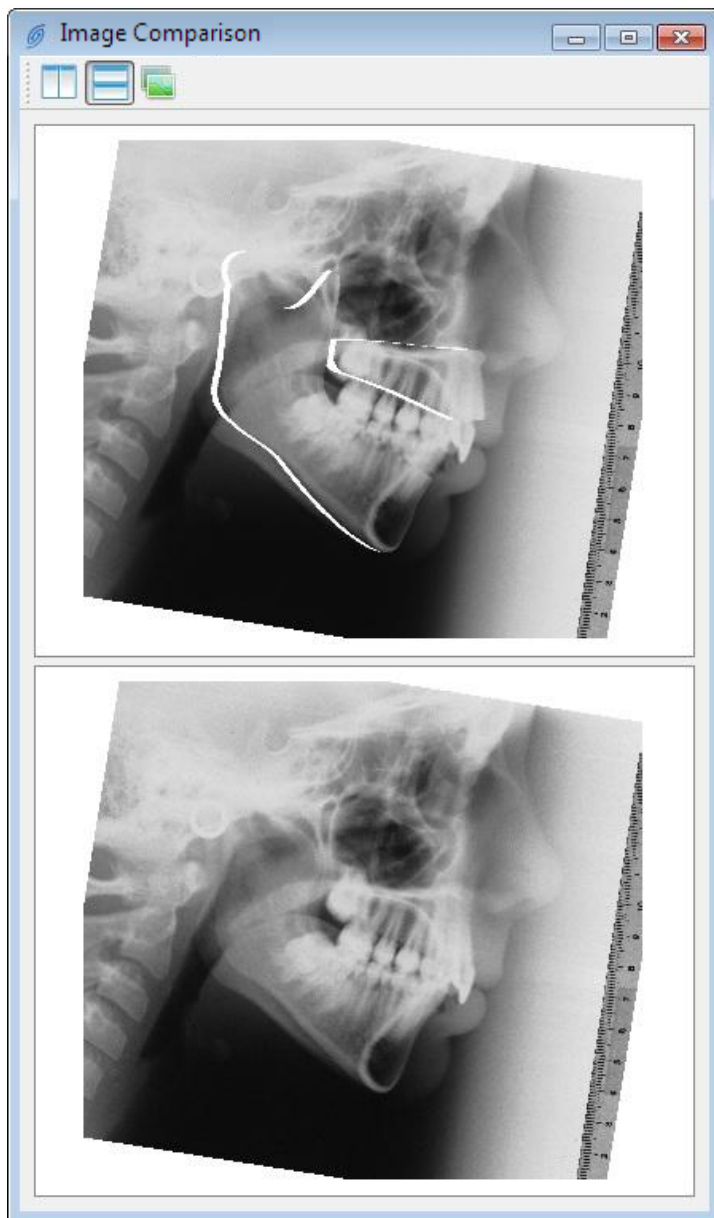
Toolbar Item	Description
	Lay out is set to horizontal.
	Lay out is set to vertical.
	Images are displayed on single viewer. Transparency of images can be adjusted using the slider control inside toolbar.

### Horizontal Layout:

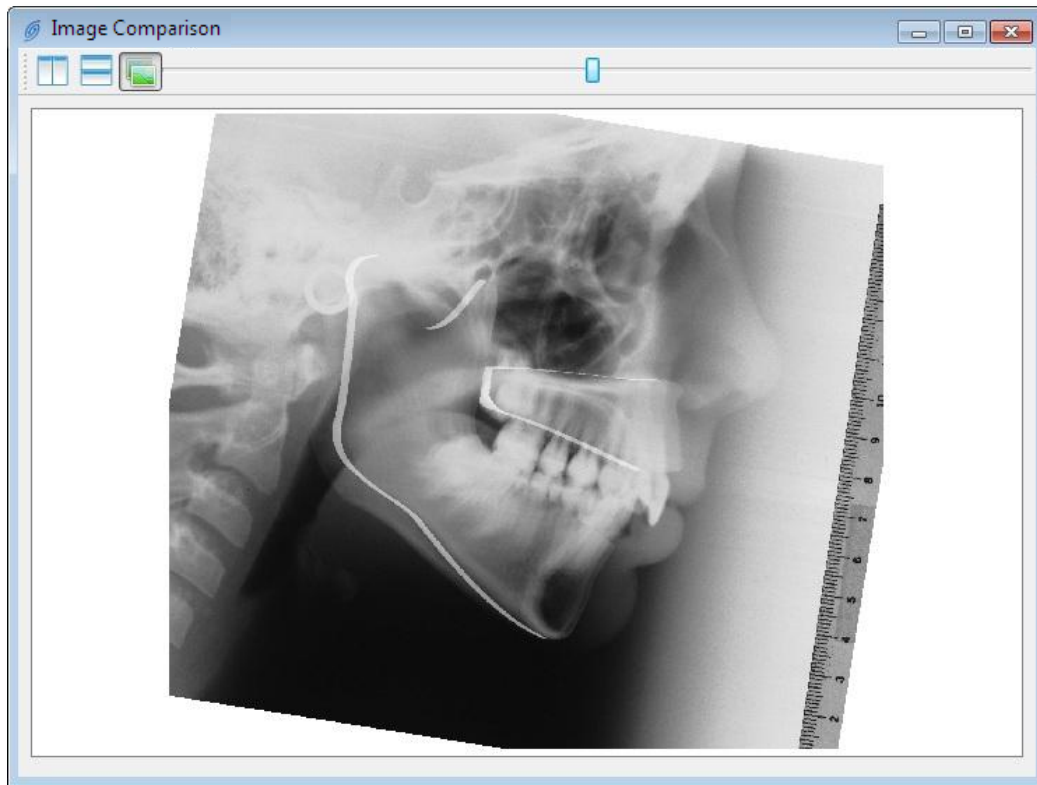




**Vertical Layout:**

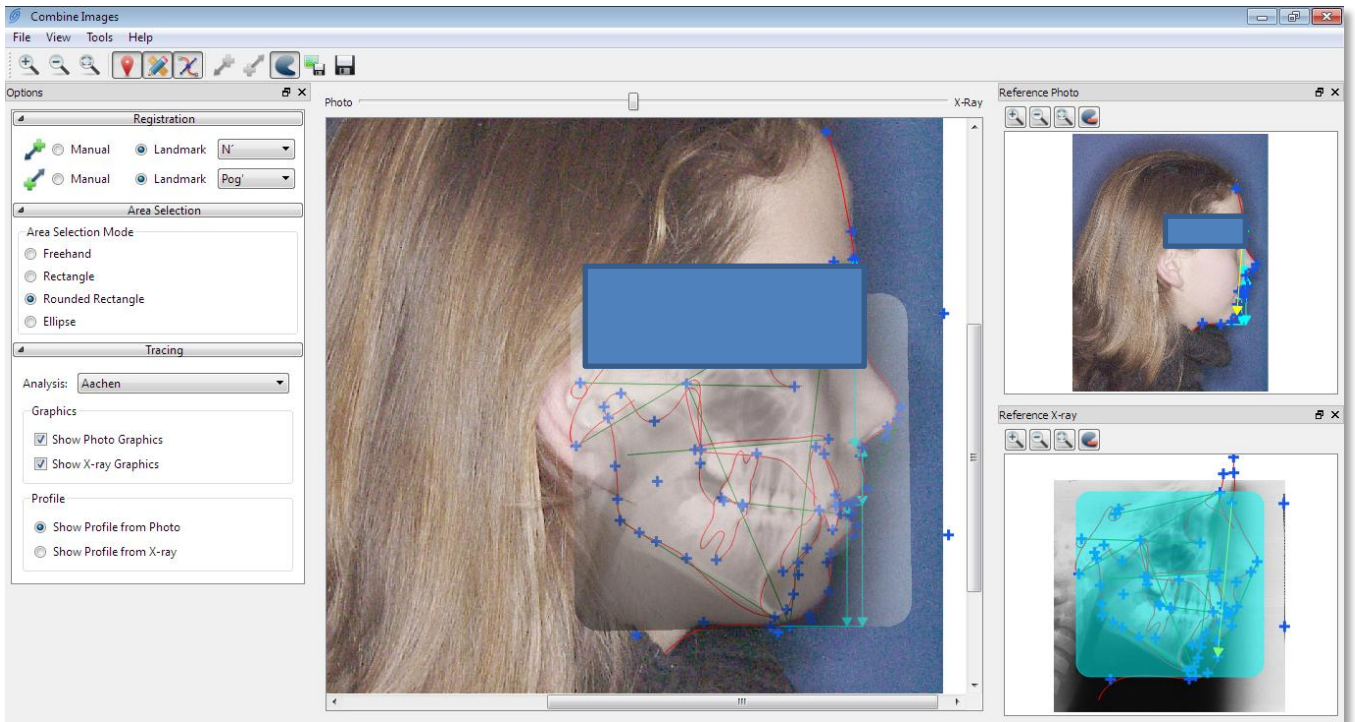


**Single Viewer:**



## Combine Image Window

User can map lateral ceph and lateral photo images using this interface. Image mapping can be performed using landmarks that exist in both images or by manually selecting corresponding points on both images.

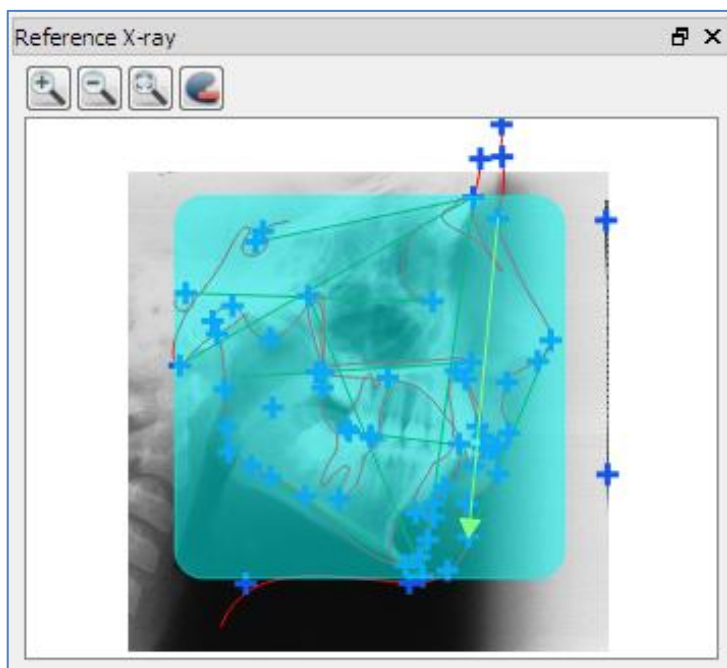






## Viewer

Combined images are displayed in this viewer.

## Reference X-ray

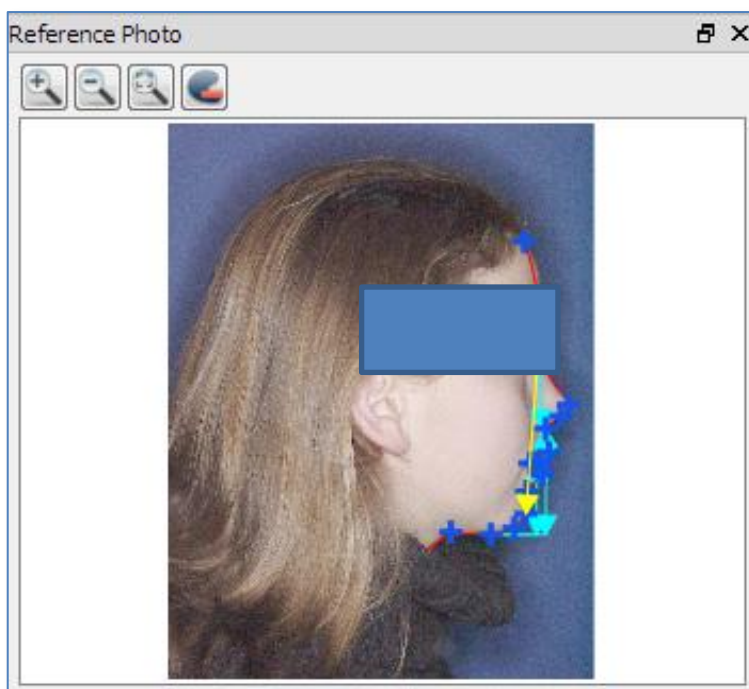
X-ray image used in combination is displayed in this viewer.







Toolbar Item	Description
	Zooms in to scene in Reference Image viewer.
	Zooms out of the scene in Reference Image viewer.
	Adjusts the zoom level of Reference Image viewer so that scene is fit inside.
	Selected part of reference image to be used in combination is reset to whole image. Selection graphic is removed from viewer.

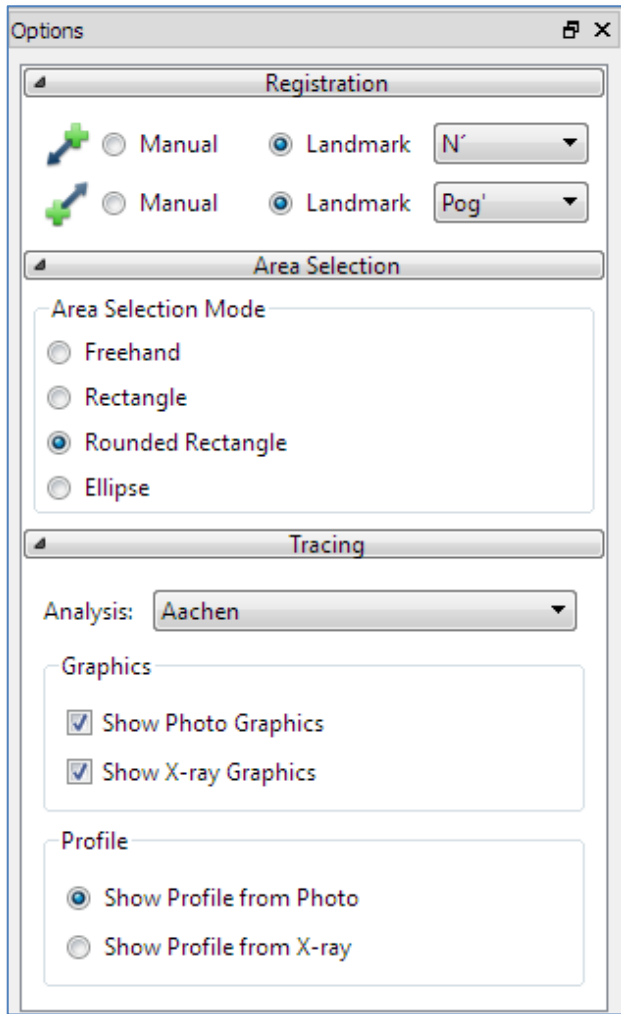
## Reference Photo

Lateral photo image used in combination is displayed in this viewer.





Toolbar Item	Description
	Zooms in to scene in Reference Image viewer.
	Zooms out of the scene in Reference Image viewer.
	Adjusts the zoom level of Reference Image viewer so that scene is fit inside.
	Selected part of reference image to be used in combination is reset to whole image. Selection graphic is removed from viewer.

## Options



### Registration

Tool	Description
 Manual	Interaction mode on reference image viewers is set to manual mapping start point setting mode.
Landmark	When checked mapping start point is selected from landmark combo box.
 Manual	Interaction mode on reference image viewers is set to manual mapping end point setting mode.
Landmark	When checked mapping end point is selected from landmark combo box.

### Area Selection

User can set current area selection mode to select parts of images from reference image viewers. Choices are listed below:












- Freehand
- Rectangle


- Rounded Rectangle
- Ellipse

## Tracing

Selected analysis graphics are displayed on patient image in viewer. To view these graphics image mapping should be finished and graphics display options should be checked from toolbar or menu. Show Photo Graphics and Show X-ray Graphics options control whether analysis graphics from related images are displayed on combined image or not. Since two profile templates are available when image mapping is finished use can select which profile template to display on combined image.

## Toolbar and Menu Item

Araç Çubuğu Öğesi	Menü Öğesi	Açıklama
	File → Save Image	Combined image in viewer is saved to the database with combine image type.
	File → Save Mapping	Registration data that maps two images is saved to the database. When these two images are opened again with <a href="#">Combine Image Window</a> this registration data will be used automatically to map these images. This data is also used when loading a letaral photo in <a href="#">Treatment Simulation Window</a> .
	File → Close	<a href="#">Combine Image Window</a> is closed.
	View → Zoom In	Zooms in to the image in viewer.
	View → Zoom Out	Zooms out from the image in viewer.
	View → Fit to Window	Adjusts the zoom level of the viewer so that all objects are visible.
	View → Layer → Landmarks	Shows / hides landmarks layer in viewer.
	View → Layer → Templates	Shows / hides templates layer in viewer.
	View → Layer → Graphics	Shows / hides analysis graphics layer in viewer.
	View → Layer → Image	Shows / hides X-ray image in viewer.
	-	Interaction mode on reference image viewers is set to manual mapping start point setting mode. Left user clicks with left mouse button on reference image, click point is set to mapping start point of related image.
	-	Interaction mode on reference image viewers is set to manual mapping end point setting mode. Left user clicks with left mouse button on reference image, click point is set to mapping end point of related image.

	-	Interaction mode on reference image viewers is set to area selection mode. Selected area with left mouse button pressed is set to selection area of related image.
	Tools → Reference Photo	<a href="#">Reference Photo</a> tool window is shown / hidden.
	Tools → Reference X-ray	<a href="#">Reference X-ray</a> tool window is shown / hidden.
	Tools → Options	<a href="#">Options</a> tool window is shown / hidden.
	Help → Help	Online help is shown.

## ***Support***

For support requests you can visit [www.totalceph.com](http://www.totalceph.com) web site or contact us via [support@totalceph.com](mailto:support@totalceph.com) e-mail address.